VOLUME 2 NUMBER 1
JANUARY 1984
$2.95

A+

THE INDEPENDENT GUIDE FOR **apple** COMPUTING

APPLES FORECAST FINANCIAL FORTUNES

- SPREADSHEET COMPARISON
- APPLE HOME BANKING
- BUDGETING À LA APPLE
- COMPUTERIZE YOUR CHECKBOOK
- LISACALC
- REVIEWS:
  - ULTRATERM
  - INCREDIBLE JACK
  - SOFTERM
- APPLE GAME REVIEWS:
  - CHOPLIFTER!
  - WITNESS
  - PLANET-MASTER
- HOW TO dBASE !

0 01
14024 14289

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • XEROX™

The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™ $99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™ $99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™ $99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™ $99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™ $149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

SATISFACTION GUARANTEED!

Every **VERSABUSINESS™** module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any **VERSABUSINESS™** module, you may return it within 30 days for a refund. Manuals for any **VERSABUSINESS™** module may be purchased for $25 each, credited toward a later purchase of that module.

To Order:

Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

* add $3 for shipping in UPS areas
* add $4 for C.O.D. or non-UPS areas
* add $5 to CANADA or MEXICO
* add proper postage elsewhere

VISA AMERICAN EXPRESS MasterCard

DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS INC

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. · *APPLE is a trademark of Apple Corp. · *IBM is a trademark of IBM Corp. · *OSBORNE is a trademark of Osborne Corp. *CP/M is a trademark of Digital Research · *XEROX is a trademark of Xerox Corp.

Reliable.

You can count on 3M diskettes. Day after day.

Just like the sun, you can rely on 3M diskettes every day. At 3M, reliability is built into every diskette. We've been in the computer media business for over 30 years. And we've never settled in. We're constantly improving and perfecting our product line, from computer tape and data cartridges to floppy disks.

3M diskettes are made at 3M. That way, we have complete control over the entire manufacturing process. And you can have complete confidence in the reliability of every 3M diskette you buy.

Apple® Compatible.

3M makes diskettes for use with Apple computers, including specially designed Fileware™ diskettes for the Lisa™ personal office system.

Look in the Yellow Pages under Computer Supplies and Parts for the 3M distributor nearest you. In Canada, write 3M Canada, Inc., London, Ontario. If it's worth remembering, it's worth 3M diskettes.

Apple, Apple logo, Fileware and Lisa are trademarks of Apple Computer, Inc.

3M hears you...

CIRCLE 289 ON READER SERVICE CARD

3M

CONTENTS

A+
THE INDEPENDENT GUIDE FOR APPLE COMPUTING

FINANCE

32 ON YOUR MARK, GET SET, CALCULATE!
By Barry Bayer
Four financial programs expand your calculating abilities.

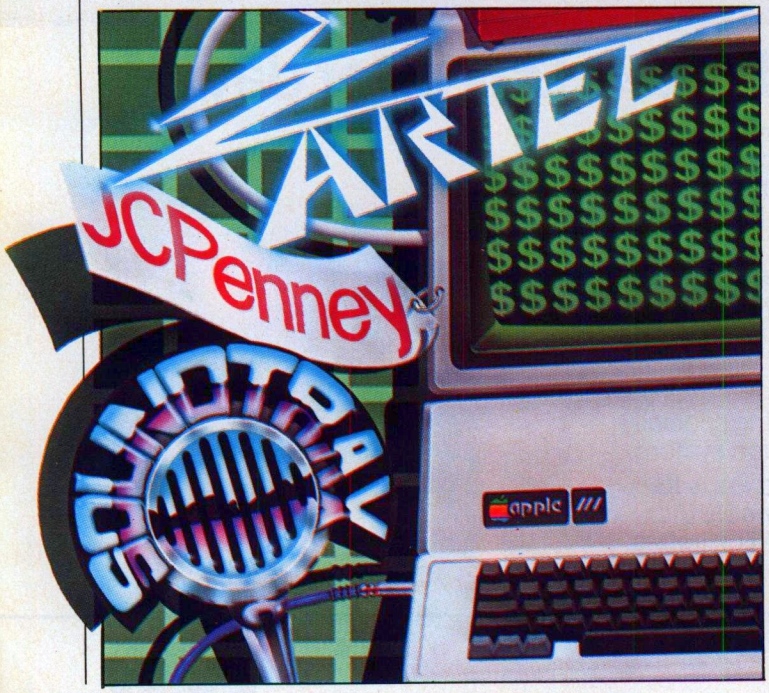
39 HOME BANKING
By Chris Albertson
Apples are reaching from your living room into your bank.

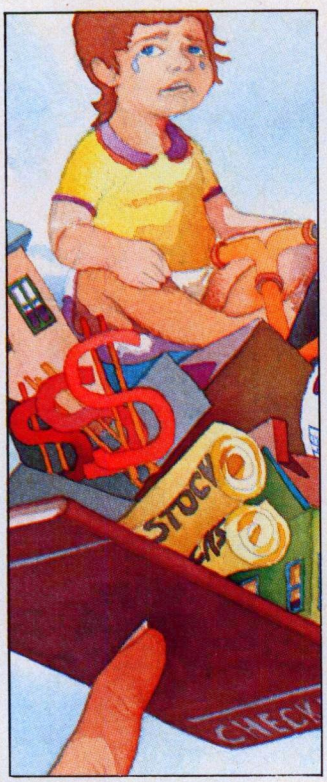
42 FINANCE FOR EVERYONE:

SOUNDTRAX
By Jan Shaw
A small recording studio swears by variety of business-software applications.

BUDGETING À LA APPLE
By Vanessa Schnatmeier
From cables to labels, firms use micros to forecast the future.

J.C. PENNEY'S CRYSTAL BALL
By Lawrence Greenberg
How a large corporation, J.C. Penney, uses a little computer, Apple, to plan the next half century





50 COMPUTERIZING YOUR CHECKBOOK
By Ellen Thro
When you've gone from a single bank account to numerous ones, it's time to turn to your Apple for help.

56 LISACALC
By Robert Cowart
The nature of the Lisa computer makes this spreadsheet program unique.

HARDWARE

74 ULTRATERM
By Hank Harrison
This video-graphics add-in card lets you make the most of your high-resolution monitor.

106 THE PERFECT TEN
By Alan Roszkiewicz
A comparison of four ten-key pads for the Apple II family of computers

SOFTWARE

64 JACK OF ALL TRADES
By Doug and Denise Green
A review of the new software product The Incredible Jack

116 DIAL A MAINFRAME
By Doug and Denise Green
A review of Softerm, Version 1.O., CRT terminal emulation for the Apple II, II Plus or IIe

PROGRAMMING

81 MAKING HI-RES CHARACTERS, PART II
By Dorothy Stark
Part II in a tutorial on making the most of Apple color graphics

TUTORIAL

159 HOW TO dBASE II
By Robert Cowart
Part III in a tutorial series on dBase II, a popular program for database management

EDUCATION

94 TEACHERS LEARN TO LOVE COMPUTING
By Elaine Fritz
Computers can cause problems in schools. One of the biggest is getting people to go home.

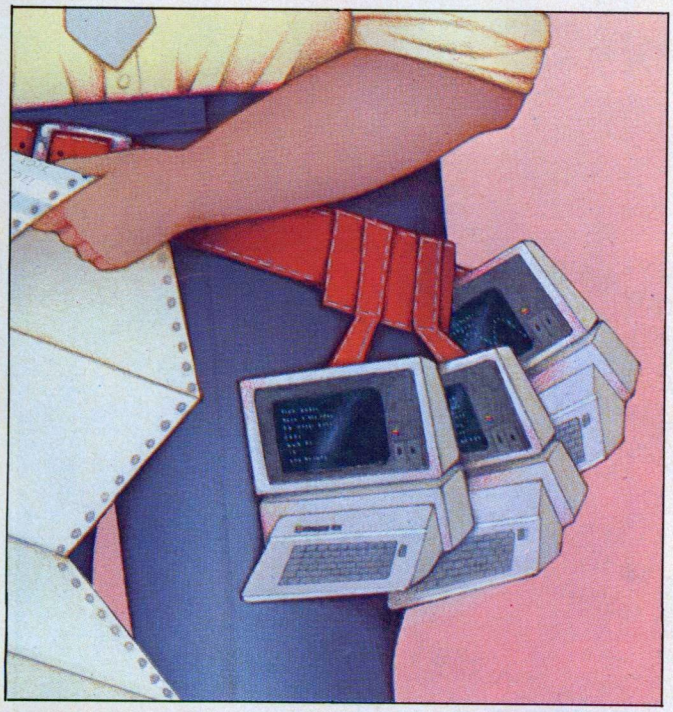
VOLUME 2/ISSUE 1/JANUARY 1984

APPLES AT WORK

126 BRIGHT SCREENS, BRIGHT HOPES
By Jill Stewart
How one man is recovering from a devastating stroke with the help of his family, friends, and an Apple computer

132 DOWN TO THE SEA IN CHIPS
By Michael Muskal
By simulating conditions at sea, Apple helps take the guesswork out of an ancient craft. The result is sleeker, fleeter boats.

138 APPLE STING
By Vanessa Schnatmeier
A successful undercover operation used an Apple III to lead thieves from drink to clink.



144 COMPUTER CRIME STOPPERS
By T.A. Arnold
The Apple's just got the facts, ma'am. And now the police have an electronic dragnet.

PROGRAMMING

154 PRODOS
By Albert Chu
First there was Apple DOS, then there was Apple SOS, and now there is ProDOS.

INSIDE APPLE COMPUTER

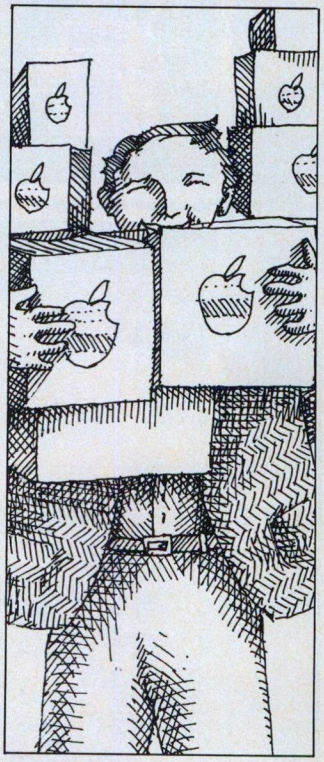
150 BEHIND THE SCENES AT APPLE COMPUTER
By Sherri Gilman-Tompkins
Apple is one of the most progressive high-tech companies around, and here are eight success stories to prove it.

DEPARTMENTS

9 EDITORIAL

13 A+ DISPATCHES
By Vanessa Schnatmeier

19 THOUGHTWARE
By Steve Rosenthal
The Basics of Finance



121 THAT'S ENTERTAINMENT
Review of Choplifter!, Witness, and PlanetMaster.

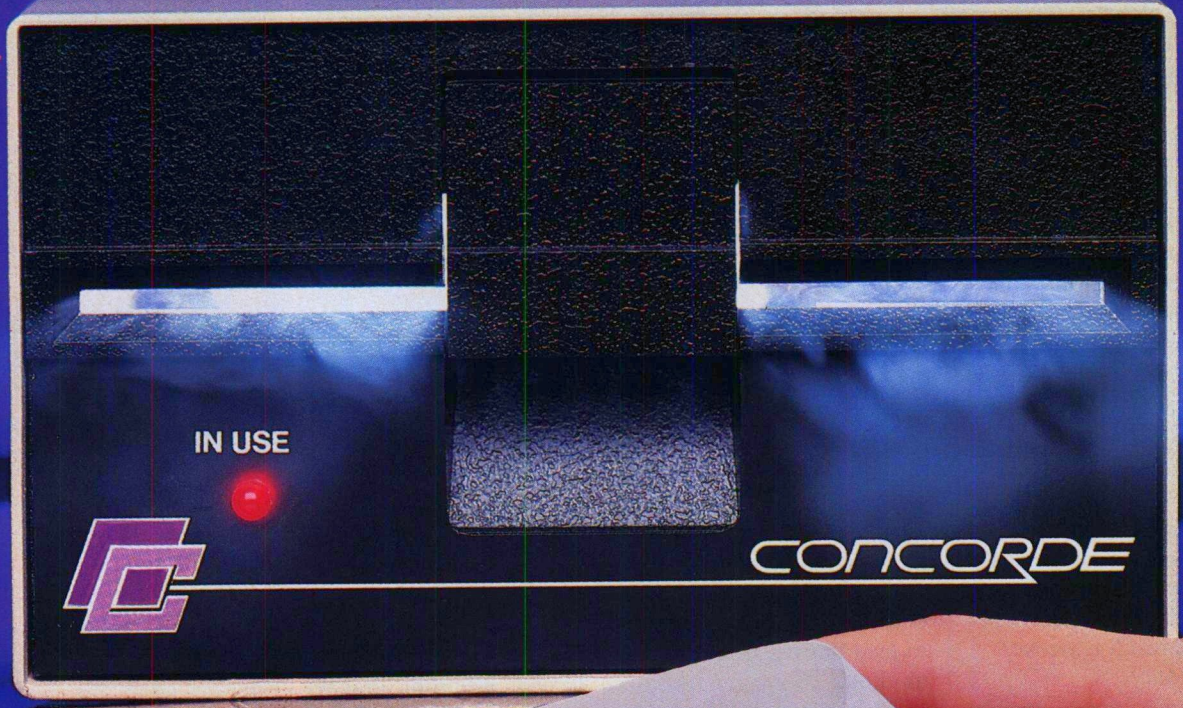
173 RESCUE SQUAD
By Lindsay McGrath

174 PRODUCT NEWS

196 COMING UP

199 INDEX TO ADVERTISERS

MEMORABLE



CONCORDE

The new leader in the world of floppy disk drives introduces its new family of Apple® compatible peripherals! Combining the finest quality drives with their own advanced electronics, **CONCORDE** gives you proven reliability and superior performance at a dramatic cost savings.

- **CONCORDE** Model C-111, Single Sided Disk Drive, gives you as much as 163K bytes of data storage . . . form, fit and function compatible with the Apple Disk II.
- **CONCORDE** Model C-112, Double Sided Disk Drive, with double the storage capacity, up to 326K, is the perfect subsystem for your Apple or Apple compatible computer.

® Apple is a registered trademark of Apple Computers Inc.

Remember **CONCORDE**!
Check it out with your favorite computer dealer, or contact:

CONCORDE

CONCORDE PERIPHERAL SYSTEMS, INC.
23152 Verdugo Drive
Laguna Hills, CA 92653
[714] 859-2850

CIRCLE 109 ON READER SERVICE CARD

Publisher
Sydney H. Rogers

Editor
Maggie Canon

Senior Copy Editor
Eva Langfeldt

Managing Editor
Leslie Steere

Staff Editor
Jane Willson

Office Manager
Marjorie Gae Brandon

Consulting Editor
Steve Rosenthal

Contributing Editors
Ellen Thro, Chris Albertson, Robert Cowart, John Zussman, Freff, Vanessa Schnatmeier, Lindsay McGrath, Ruth Saperstein, Alan Roszkiewicz

Art Direction
Don Menell Directions

Contributing Art Director
Michael Brock

Assistant Art Directors
Mariano Nicieza, Angela Giglia, Debra Vodhanel

Art Assistants
Deborah Barnett, Ann Lowe, Lisa Herring

Cover: Robert Peak Photography
Illustrators: Craig Calsbeek (pp. 56, 144); Phil Carlig (pp. 150-153); Art Curtis (p. 50); Alan Daniels (pp. 42-49, 132); Diane Teske Harris (p. 64); John Hull (p. 106); Catherine Kanner (pp. 13-15); Doug Paulin (p. 19); Charles Shields (p. 32); Donna Tarzian (p. 154, 173)
Photography: Tom Keller (pp. 94, 150-153)

Subscription Director	Chet Klimuszko
Telemarketing Manager	Linda Rossiter
New Business Manager	Eric A. Bernhard
Renewal and Billing Manager	Shane Boel
Retail Sales Manager	Gerald Grossman
Advertising Coordinator	Leslie C. Phillip
Advertising Manager	Ted M. Welch
West Coast Manager	Denise M. Pilnak
East Coast Manager	Suzanne M. Zellner
Account Representatives	EAST COAST Jeffrey L. Tompkins MID-WEST Kathryn J. Cumberlander WEST COAST Thomas E. Richardson, Cindy M. Silverman

Advertising Office
Ziff-Davis Publishing Company, One Park Avenue, New York, NY 10016, (212) 725-7947

CONSUMER COMPUTERS & ELECTRONICS MAGAZINE DIVISION

President	Larry Sporn
Publishing Director	J. Scott Briggs
Vice President Circulation	Carole Mandel
Vice President General Manager	Eileen G. Markowitz
Creative Director	Peter J. Blank
Editorial Director	Jonathan D. Lazarus
Promotion Manager	Ronnie Sonnenberg

ZIFF-DAVIS PUBLISHING
President Richard P. Friese; President Consumer Magazine Division Albert S. Traina; Executive Vice President, Marketing and Circulation Paul H. Chook; Senior Vice President Phillip T. Heffernan; Senior Vice President Sidney Holtz; Senior Vice President Edward D. Muhfeld; Senior Vice President Sidney Holtz; Senior Vice President Edward D. Muhfeld; Senior Vice President Philip Sine; Vice President Baird Davis; Vice President George Morrissey; Treasurer Selwyn Taubman; Secretary Bertram A. Abrams

A+: The Independent Guide for Apple Computing ISSN (#0740-1590) is published for $24.97 one year, $43.97 two years, and $53.97 three years. Additional postage $12 for Canada, $12 other foreign by Ziff-Davis Publishing Co., One Park Ave., New York, NY 10016. Second-Class pending at New York, NY 10016 and at additional mailing offices. POSTMASTER: Send address changes to A+, P.O. Box 2965, Boulder, CO 80321. BPA membership (SMA Division) applied for October 1983.

Editorial and Business Office: One Park Ave., New York, NY 10016. Editorial (212) 725-4694, Advertising (212) 725-7947. For subscription inquiries and service, write to A+, P.O. Box 2965, Boulder, CO 80321.

A+ is an independent journal, not affiliated in any way with Apple Computer, Inc. Apple is a registered trademark of Apple Computer, Inc. Entire contents Copyright © 1983 Ziff-Davis Publishing Co. All rights reserved; reproduction in whole or in part without permission is prohibited. The following are trademarks of Ziff-Davis Publishing Co.: A+, A+: The Independent Guide for Apple Computing, Dispatches, Rescue Squad, Thoughtware, That's Entertainment.

Permissions: Material in this publication may not be reproduced in any form without permission. Requests for permission should be directed to Bette Amado, Ziff-Davis Publishing Company, New York, NY 10016.

A name to remember for memory in a hurry.

flashcard™

disk emulator for Apple® computers

Packaged with business software for lightning fast processing.

Or, *flashcard* is packaged alone with drive diskettes for DOS 3.3, CP/M® and Pascal for software compatibility with popular programs such as Word Star® and dBase II®

Bonus Offer: For a tidy turnkey solution to boosting business output, *flashcard* also comes packaged with MagiCalc® spreadsheet software from Artsci. MagiCalc is a superior, state of the art program that is fast, friendly and filled with features. And it is fully compatible with VisiCalc files.

Why *flashcard*?: Plug *flashcard* into your Apple and enjoy fast, smooth, no-wait computing. No more "disk wait" messages. No mechanical delays. No more noise as the disk chatters and clatters through a file search. And no wear and tear on your program diskettes. Instead, *flashcard* displays your data the instant you ask for it.

Your computer store should have *flashcard* in stock. If not, ask him to order one for you.

***flashcard* with MagiCalc**	**$595**
***flashcard*, 144k disk**	**$349**
***flashcard*, 288k disk**	**$529**

Synetix Inc.
10635 N.E. 38th Place
Kirkland, WA 98033
(206) 828-4884
(800) 426-7412

CIRCLE 139 ON READER SERVICE CARD

™ Flashcard is a registered trademark of Synetix, Inc., 1983
™ Apple is a registered trademark of Apple Computer, Inc.
™ MagiCalc is a registered trademark of Artsci, Inc.
™ CP/M is a registered trademark of Digital Research, Inc.
™ dBase II is a registered trademark of Ashton-Tate.
™ WordStar is a registered trademark of MircroPro.

Inside Apple

Vol. 1, No. 4

A dot matrix printer that will improve your image.

Meet the Apple® Imagewriter, the newest dot matrix printer for your Apple Personal Computer.

And with all that it has going for it, just maybe the best dot matrix printer on the market.

Take legibility, for instance.

The Imagewriter crams 140 x 160 dots into each square inch. So you get text that's highly readable and high resolution graphics, besides.

And is it fast.

The Imagewriter cruises at an unbelievable 120 characters per second. And that's just in the text mode. It's even faster printing graphics. 180 characters per second, to be exact.

What's more, the graphics dump is up to 60% faster than other comparably priced dot matrix printers. And that makes the Imagewriter fast enough to handle the Lisa.™

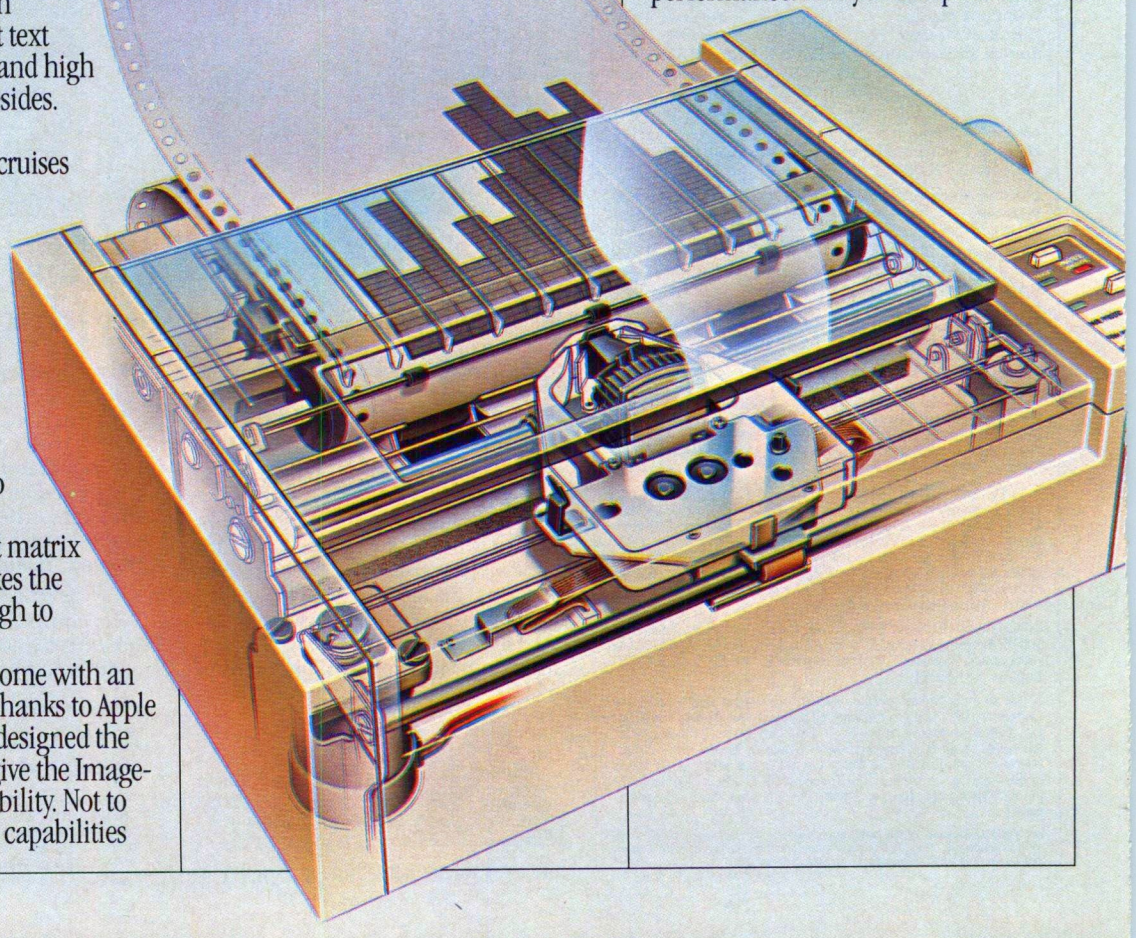
Yet it's just as at home with an Apple III or Apple IIe. Thanks to Apple software experts who designed the control electronics to give the Imagewriter perfect compatibility. Not to mention some special capabilities like superscript and subscript, to name just two.

Now, with all this high-speed performance, you'd expect the Imagewriter to make the Devil's Own Noise. It doesn't. In fact, the Imagewriter is specially constructed — with overlaid seams and special sound-deadening materials — to achieve a remarkable 53 dB. How loud is a remarkable 53 dB? You'd make more noise if you read this aloud.

The Imagewriter even has quiet good looks, since we designed it to look like the rest of the Apple Family.

Yet even with all its improvements, the Imagewriter is a better deal than any other dot matrix printer with comparable performance. And you can print that.

APPLE PRESENTS TH
E IMAGEWRITER APPLE PR
ESENTS THE IMAGEWRITER APPLE PRESENT
S THE IMAGEWRITER APPLE PRESENTS THE IMAGEWRITER APPL



Charge!

Go out there and get the Apple Personal Computer System you really want. Now. Without laying out your extra cash. Without tying up your other lines of credit. With the Apple Card. The only consumer credit card reserved exclusively for the purchase of Apple Computers, peripherals and software.

Like all our products, it works simply:

Fill out an application (short, to the point and annotated in English) at an authorized Apple dealer honoring the Card. Your salesperson will call in the application and in most cases get an approval for you right on the spot.

You can then take your Apple system home. You don't even have to wait for the Card; we'll mail it out to you. And by the time you get it, you'll probably be well into doing whatever you bought your Apple system to do.

There is no annual fee for the Card, although a couple of restrictions do apply. The first purchase must include an Apple Personal Computer and you have to put 10% down. And subsequent purchases need to be at least $100 if made with the Card. Oh, yes — you'll also have a credit limit.

When you use the Apple Card to make additional purchases, all you have to do is show the Card and sign the invoice. As long as it's within your credit limit, of course. Our dealers get a little nervous when someone signs for half their inventory. You understand.

You'll also receive monthly statements that include the latest purchases, credit available, and the minimum payment due. You'll also be happy to know Apple Card credit terms are affordable and the payments can be spread out. It's all spelled out for you at the time your Card is approved.

So stop by a participating authorized Apple dealer and get an Apple Card. Just think of it as credit where credit is due.

Give your floppy disks the boot.

We call it the "floppy disk shuffle." It happens when you have two or more software programs on floppies and you need to work with both. What do you do? You put one disk in, boot it, do your work, take it out, put the other disk in, boot it, do your work — you get the idea.

Well, you can stop shuffling any time now.

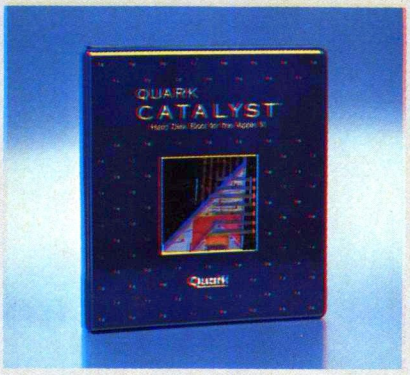
Thanks to a unique new software program called Catalyst™ from Quark, Inc. Specially designed for your Apple III and ProFile™ hard disk.

Catalyst allows you to take a wide variety of software programs and store them on your ProFile. Once they're on your ProFile, you just select the program you want from the Catalyst menu that appears on your monitor — then Catalyst does the rest. You'll never have to boot those programs again.

What kinds of programs will work with ProFile and Catalyst? Almost anything written for the Apple III including copy-protected programs like VisiCalc,® Quick File™ and Apple Writer III. Or languages like Pascal, BASIC, or COBOL.

And once you've loaded these programs into your ProFile, the only diskette you may ever need is the Catalyst.

So if you have an Apple III and a ProFile and more floppies than you care to flip through, get yourself a Catalyst. And boot those disks for good.



Apple Computer Inc., 20525 Mariani Ave., Cupertino, CA 95014. For the authorized Apple dealer nearest you, call **(800) 538-9696.** *In Canada, call* **(800) 268-7796** *or* **(800) 268-7637.** *© 1983 Apple Computer Inc.*

VisiCalc is a trademark of VisiCorp, Inc. Catalyst is a trademark of Quark, Inc. Apple, the Apple logo, Quick File and ProFile are trademarks of Apple Computer Inc.

AFTER YOUR FIRST DRIVE GO WITH AMDISK.

The AMDISK-I Micro-floppy disk system is an engineering breakthrough in disk size, storage capacity, media protection and user convenience. It's fully compatible with your Apple II*® and Apple IIe and is furnished with an interconnect cable. Enjoy a full 286K storage† capability and the extra convenience of the new 3" hard plastic encased diskette. Packed 10 per box, the disk cartridge fits into a shirt pocket and is easy to mail.

Suggested Retail Price . . . . $299 (3" cartridge $6.99 ea.)

The Amdisk Single Drive system is ruggedly constructed for years of trouble-free operation and is backed with our 90 day warranty on parts and labor.

Just circle the reader service number for complete specifications.

* Apple II is a registered trademark of Apple Computer, Inc.
† Requires recording on both sides

2201 Lively Blvd. • Elk Grove Village, IL 60007
(312) 364-1180 TLX: 25-4786

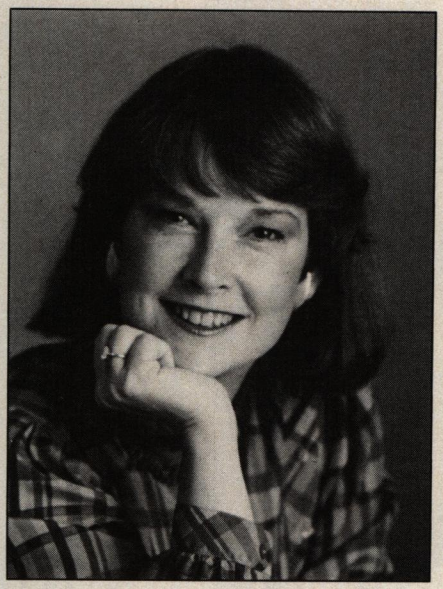
AMDEK CORP.

CIRCLE 107 ON READER SERVICE CARD

REGIONAL OFFICES: Calif. (714) 662-3949 • Texas (817) 498-2334

Amdek . . . your guide to innovative computing!

EDITORIAL
A MESSAGE FROM MAGGIE



I overheard a conversation the other day while waiting in line at the checkout counter that disturbed and intrigued me. As I waited to pay for my groceries, a young couple was discussing the case of several computer whiz kids caught accessing classified military material with their computers.

Several FBI agents had climbed in through the windows of the kids' homes the day before and arrested them for computer capers similar to those committed by the young protagonist of the recent film *WarGames*. The young couple launched into a debate about the ethics of the situation.

The crux of their discussion was the question of whether or not the kids were in fact guilty of a crime or guilty of natural curiosity. Who was ultimately responsible for preventing such actions? The man took the stance that the military and any other owners of sensitive material should adequately protect such information. He did not consider it a crime that the computer aces had succeeded in cracking military databases. His companion argued that it was a crime to try to break into the computer system, just as it was a crime to break into a store. It did not matter, she said, whether or not the store was adequately locked or whether the kids were just trying to break in out of natural curiosity. He felt it was the government's responsibility to ensure the safety of the classified information and that the system should be inviolable. She felt it was society's responsibility to teach people that accessing other people's data without paying for it or having permission was a crime.

I never did find out how the couple resolved their moral and philosophical differences, but their discussion did start me thinking. I found myself sympathizing with both sides of the issue, because each side had valid points to make.

First, as much as I enjoyed *WarGames,* the movie did not make it clear that accessing classified military information is not only illegal but is also punishable by prison sentences. So it comes as no surprise that some kids might try to pull a similar stunt—people often imitate what they see on television or in a movie.

As personal computers become more widespread, we will all have a responsibility to define what computer crime is and let everyone know the rules.

As personal computers become more widespread, we will all have a responsibility to define what computer crime is and let everyone know the rules and consequences of the game. To determine what computer crime is, we must decide that information can be solely owned and thus protected. Given that decision, we can determine ownership and therefore that it is a crime to take what is owned by another. We do have laws that govern computer activities, but these laws are still in raw form and must be refined to be effective.

I am not at all convinced that parents and teachers are instilling "computer ethics" in children. How many of you have sat down and told your sons or daughters that certain uses of computers are illegal? How many schools and universities are offering courses in computer ethics? (I do know of some schools that offer such classes.) In order to ensure some form of law and order in the world of computers, we are responsible for educating both young and old about the legal and illegal use of computers.

On the other hand, even when they are instructed in the rules and regulations of computing, some people will still try to "crack the code," if only for the pure intellectual fun of it. So, I also agree with the young man that the owners of classified or valuable information must protect that information from electronic intruders. Protecting the data lines that transmit sensitive information is possible, but expensive and time-consuming. Considering the stakes, the investment is well worth it, however.

Thus, I find myself straddling the fence. Yes, it is the responsibility of the owners of information to protect it. And, yes, it is a crime to break into a computer system, just as it is a crime to break into a store. But it is our duty to ensure that everyone is informed of the laws concerning computers. As we begin the new year, I hope that 1984 will bring more attention to the problem of protecting electronic information without the ominous overtones of George Orwell's *1984*. ✚

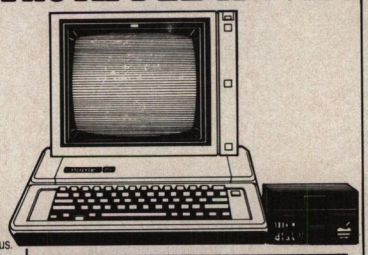
Maggie Canon

The Choice of

SAVE THIS AD IT IS YOUR CATALOG AND CHANGES MONTHLY.

HARDWARE For The APPLE II+/IIe

APPLE IIe 128K, 80 COLUMN $1,295
APPLE IIe, STARTER SYS. BY APPLE (Sys. A)
64K and 80 column
Disk II with controller
Apple Monitor $1,650
APPLE IIe STARTER SYSTEM BY CONROY-LA POINTE [SYSTEM B]
128K and 80 column
1 Micro-Sci Drive with controller
Filer, Utility and Apple DOS 3.3 Diskette
Zenith 12" Green Monitor
RF Modulator (for color TV)
Game Paddles
Game w color graphics and sound
20 Blank Diskettes $1,650



LIMITED WARRANTY: is 100% Parts & Labor for 90 days by us.

DISK DRIVES

★ **CENTRAL PT.**, Filer, Utility & Apple DOS		$ 20	$ 15
μ-SCI MICRO-SCI	A2, 143K Disk Drive	$ 479	$ 230
	A2 Controller Card	$ 100	$ 79
	★A40, 160K. Drive	$ 449	$ 299
	★A70, 286K. Drive	$ 599	$ 299
	A40 A70 Controller	$ 100	$ 79
SUPER 5, 1/2 HIGH	ALPS, A40, Belt Drive, 163K	$ 299	$ 199
	TEAC, T40, Direct Drive, 163K	$ 349	$ 239
	TEAC, T80, Double Sided, 326K Controller Card	$ 449	$ 329
		$ 110	$ 59
Rana	Elite 1, 163K, 40 TK	$ 379	$ 249
	Elite 2, 326K, 80 TK	$ 649	$ 399
	Elite 3, 652K, 160 TK	$ 849	$ 499
	Elite Controller	$ 145	$ 84
VISTA	DiskPak V1200, 6MB Backup Sys.	$1549	$1049

OVERSTOCK SPECIALS
WHILE THEY LAST

★ **Axlon**, 320K RAM Disk System (+ or e)	$1000	$650
★ **CCS**, Serial Interface 7710A (Set Baud)	$ 150	$ 99
★ **ComX**, 16K RAM Card, 1Yr. Wty., for II+	$ 179	$ 39
Microsoft, 16K RAMCard for II+	$ 100	$ 69
★ **Silicon Valley**, Word Handler	$ 250	$ 39
List Handler	$ 90	$ 35
Videx, Videoterm, 80 column card for II+	$ 345	$229

RAM EXPANSION

★ **ComX**, for IIe, 80 col. 64K Adder Card	$ 295	$145
★ **ComX**, RAM Card, 1 Yr. Wty. (II+) 16K	$ 179	$ 39
★ **ALS**, ADDRam (II+) 16K	$ 100	$ 59
★ **Microsoft**, RAMCard (II+) 16K	$ 100	$ 69
★ **Saturn Systems**, RAM Card (II+) 32K	$ 249	$169
RAM Card (II+) 64K	$ 425	$299
RAM Card (II+) 128K	$ 599	$399
★ **Axlon RAM Disk System** (+ or e) 320K	$1000	$650

VIDEO CARDS

★ **ALS**, Smarterm II (+ or e)	$ 179	$139
ComX, 80 col. 64K Adder (IIe)	$ 295	$145
Videx, Videoterm 80 col. (+ or e)	$ 345	$229
★ UltraTerm (+ or e)	$ 379	$279
Soft Video Switch (II+)	$ 35	$ 25
Enhancer II (II+)	$ 149	$ 99
Function Strip (II+)	$ 79	$ 59
We Have Full Videx Line.	Call.	Up to 35% off.
Vista, Vision 80	$ 289	$199

MISCELLANEOUS

ALS, The CP/M Card V3.0 (+ or e)	$ 399	$299
Z-Card (+ or e)	$ 169	$129
Color II (+ or e)	$ 179	$139
ASTAR, RF Modulator, to use TV	$ 35	$ 25
★ **CCS**, Serial Interface 7710A	$ 150	$ 99
Eastside, Wild Card (copier, + or e)	$ 140	$ 99
Wild Card Plus	$ 190	$139
Kensington, System Saver	$ 90	$ 65
Key Tronic, KB200 keyboard (II+)	$ 298	$219
★ **Koala**, Graphics Pad	$ 125	$ 85
Kraft, Joystick (Ap II/II+)	$ 65	$ 49
Paddle (Ap II/II+)	$ 50	$ 39
M&R, Sup R fan (+ or e)	$ 50	$ 39
★ **Microsoft**, Z80 Softcard (+ or e)	$ 345	$235
Z80 Softcard Plus (+ or e)	$ 645	$459
Softcard Premium Pack (II+)	$ 695	$495
Softcard Premium Pack (IIe)	$ 495	$395
Micro Tek, Dumpling 64, Buffer	$ 349	$269
★ **Orange Micro**, Grappler Plus (e or +)	$ 175	$119
16K Buffer Board for Grappler +	$ 175	$119
Buffered Grappler +, 16K	$ 245	$179
Paymar, Lower Case Chip (II+)	$ 50	$ 39
★ **PCPI**, Appli-Card, 14 features 6 Mhz	$ 375	$275
128K Memory Expand Board	$ 495	$395
RH Electronics, Super Fan II	$ 75	$ 59
★ **Saturn Systems**, Accelerator II	$ 599	$449
Transcend, SSM, AIOII, Serial/Para I/F	$ 225	$169
TG Products, Game Paddles (II+)	$ 40	$ 29
Joystick (II+)	$ 60	$ 45

SOFTWARE for APPLE II+/IIe

BUSINESS

Applied Soft Tech., VersaForm	$ 389	$259
Artsci, MagicWindow II NEW!	$ 150	$ 99
Magic Combo (Wind, Mail & Words)	$ 225	$149
★ **Ashton-Tate**, dBase II (Req CP/M 80)	$ 700	$385
Financial Planner (Req CP/M 80)	$ 700	$395
Friday (Requires CP/M 80)	$ 295	$199
BPI Systems, GL, AR, AP, PR or INV, each	$ 395	$295
Broderbund, Bank Street Writer	$ 70	$ 47
Continental, GL, AR, AP or PR ea	$ 250	$165
Home Accountant	$ 75	$ 49
FCM	$ 100	$ 69
Dow Jones, Market Analyzer	$ 350	$275
Market Manager	$ 300	$235
Market Microscope	$ 700	$525
Fox & Geller, Quickcode (for dBase II)	$ 295	$185
dGraph (for dBase II)	$ 295	$185
dUtility (for dBase II)	$ 99	$ 66
Hayden, Pie Writer (Specify 80 col. board)	$ 150	$ 99
Howard Soft, Real Estate Analyzer II	$ 195	$129
Tax Preparer	$ 225	$149
LJK, Letter Perfect w/Mail Merge	$ 150	$ 99
Micro Craft, (requires Z80 CP/M-Card) Verdict or Billkeeper	$ 995	$469
Micro Lab, Tax Manager	$ 180	$119
Micro Pro, (all require Z80-CP/M Card)		
★ WordStar w/ Applicard & CP/M SPECIAL	$ 495	$325
WordStar® + Training Manual SPECIAL	$ 495	$239
MailMerge™ SPECIAL	$ 250	$129
SpellStar™ SPECIAL	$ 250	$129
★ WordStar Professional, 4 Pak SPECIAL	$ 895	$429
Microsoft, Multi-Plan (CP/M or Apple DOS)	$ 275	$175
Financial, Multitool (CP/M or DOS)	$ 100	$ 75
Budget, Multitool (CP/M or DOS)	$ 150	$115
★ **Osborne/C.P. Soft**, (Disk and Book) (Stat., Bus. & Math)		
Some Common Basic Programs (75 each)	$ 100	$ 49
Practical Basic Programs (40 each)	$ 100	$ 49
Peachtree, Requires CP/M & MBasic, 40 columns.		
Series 40 GL & AR & AP, all 3	$ 595	$365
Series 9 Text & Spell & Mail, all 3	$ 595	$395
Perfect, Perfect Writer	$ 495	$149
Perfect Speller	$ 295	$ 99
Perfect Writer/Speller 2 Pak	$ 695	$199
Perfect Filer	$ 595	$259
Quark, Word Juggler (IIe)	$ 239	$179
Lexicheck IIe (use w/Juggler)	$ 149	$ 99
Sensible, Sens. Speller, specify 80 Col. Brd.	$ 125	$ 85
Sierra/On-Line, ScreenWriter Professional	$ 200	$135
ScreenWriter II	$ 130	$ 89
The Dictionary NEW!	$ 100	$ 69
General Manager II NEW!	$ 230	$155
★ **Silcon Valley**, Word Handler	$ 250	$ 39
★ List Handler	$ 90	$ 35
Software Publishing, PFS: File	$ 125	$ 84
(specify + or e) PFS: Report	$ 125	$ 84
PFS: Graph	$ 125	$ 84
Stoneware, DB Master Version 4.0	$ 350	$ 229
DB Utility I or II	$ 99	$ 69

BUSINESS

System Plus, GL, A/P, & A/R, 3 Pak	$ 995	$ 555
Videx, Applewriter II preboot disk	$ 20	$ 15
Visicalc 80 col. preboot disk	$ 50	$ 39
VisiCorp/Personal Software.		
Visicalc 3.3	$ 250	$ 169
Visicalc Enhanced (IIe) NEW!	$ 250	$ 179
VisiFile or VisiDex, each	$ 250	$ 179

UTILITY & SYSTEM

Beagle, Apple Mechanic	$ 30	$ 22
Double-Take	$ 35	$ 25
Typefaces (Req. Ap. Mechanic)	$ 20	$ 15
DOSS Boss or Utility City, each	$ 30	$ 22
Tip Disk #1	$ 20	$ 15
Pronto DOSS	$ 30	$ 20
Alpha Plot	$ 40	$ 27
Central Point, Filer, DOS 3.3 and Utility	$ 20	$ 15
★ Copy II Plus (bit copier)	$ 40	$ 30
Einstein, Compiler, for Applesoft BASIC	$ 129	$ 85
Epson, Graphics Dump	$ 15	$ 9
Hayes, Terminal Program	$ 100	$ 65
★ **Insoft**, GraFORTH by Paul Lutus	$ 75	$ 59
Microsoft, A.L.D.S.	$ 125	$ 75
Cobol 80	$ 750	$ 559
Fortran 80	$ 195	$ 149
COMPLETE LINE IN STOCK		
★ **Omega**, Locksmith (bit copier)	$ 100	$ 75
Penguin, Comp. Grphcs. Sys. NEW!	$ 70	$ 53
Graphics Magician NEW!	$ 60	$ 41
Phoenix, Zoom Grafix	$ 40	$ 34
Quality, Bag of Tricks NEW!	$ 40	$ 29

HOME & EDUCATIONAL

Beagle Bros., Beagle Bag	$ 30	$ 22
Broderbund, Choplifter	$ 35	$ 26
Arcade Machine	$ 60	$ 40
Lode Runner	$ 35	$ 25
Apple Panic	$ 30	$ 21
BudgeCo, Pinball Constr. Set	$ 40	$ 27
★ **Continental**, Home Accountant	$ 75	$ 49
Datasoft, Aztec or Zaxxon, each	$ 40	$ 27
Edu-Ware, (Large Inventory)	Call	Call
Einstein, Memory Trainer	$ 90	$ 70
Hayden, Sargon II (Chess)	$ 35	$ 29
Infocom, Zork I, II, or III, or Starcross, each	$ 40	$ 27
Koala, Full line in stock, CALL		
Learning Co., (Large Inventory)	Call	Call
Lightning, Mastertype	$ 40	$ 27
Micro Lab, Miner 2049er	$ 40	$ 27
Sierra/On-Line, Ultima II	$ 60	$ 40
Sir-Tech, Wizardry	$ 50	$ 39
Spinnaker, Kindercomp	$ 30	$ 20
Sub Logic, Flight Simulation or Pinball, ea.	$ 35	$ 25
Terrapin, Logo	$ 150	$ 99

OTHER BRANDS AND PROGRAMS IN STOCK. CALL.

8" CP/M-80 SOFTWARE

MUCH MORE. IN STOCK	LIST PRICE	OUR PRICE
ASHTON-TATE, dBase II	$ 700	$ 385
Financial Planning Lang.	$ 700	$ 439
Friday	$ 295	$ 249
BLUE CHIP, Millionaire	$ 70	$ 43
DIGITAL RES., CBASIC	$ 150	$ 99
CBASIC Compiler (CB80)	$ 500	$ 339
Pascal MT+	$ 350	$ 239
CIS COBOL	$ 850	$ 575
PL/1	$ 550	$ 375
C Compiler	$ 350	$ 250
FOX & GELLER, Quick Code	$ 295	$ 185
dUtil	$ 99	$ 62
dGraph	$ 295	$ 185
INFOCOM, Starcross, Zork I, II or III, each	$ 50	$ 34
Deadline or Planetfall, each	$ 60	$ 40
MICROCRAFT, Verdict or Billkeeper, each	$ 995	$ 495
MICROPRO, WordStar®	$ 495	$ 239
MailMerge™	$ 250	$ 129
WordStar Prof.. 4 Pak	$ 895	$ 429
MICROSOFT, Multiplan	$ 275	$ 195
COBOL-80 Compiler **SPECIAL**	$ 750	$ 350

PLOTTERS

	LIST PRICE	OUR PRICE
BAUSCH & LOMB, HOUSTON		
DMP-40, 1 pen		$ 725
DMP-29, 8 pen		$1695
DMP-41		$2250
AMDEK, DXY-100, 10" x 14", Para	$ 749	$ 599
Amplot II, 10" x 14", 6 color, S/P	$1299	$ 999
hp H P 12C	$ 120	$ 99
H P 11C	$ 90	$ 75

Call on accessories and software.

for the ATARI

RANA 1000 Drive, 320K	$ 449	$ 369
KOALA, Graphics Pad	$ 100	$ 75

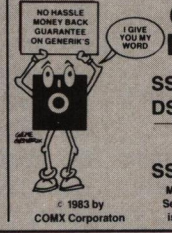
DISKETTES

	LIST PRICE	OUR PRICE
BROWN DISC		
10 each. Pulse I. DS DD. 48TPI	$ 45	$ 32
10 each. Pulse II. DS QD. 96TPI	$ 60	$ 45
CDC		
100 each. SS. SD. 35T (Apple. Atari)	$ 450	$ 169
10 each. SS. SD. 35T (Apple. Atari)	$ 45	$ 18
100 each. SS. DD. 48T (Apple. IBM)	$ 550	$ 179
10 each. SS. DD. 48T (Apple. IBM)	$ 55	$ 19
100 each. DS. DD. 48T. (IBM. H P)	$ 750	$ 295
10 each. DS. DD. 48T (IBM. H P)	$ 75	$ 35
DYSAN. 10 each. SS SD (Apple. etc.)	$ 69	$ 39
10 each. DS DD 48T (IBM. H P. etc.)	$ 89	$ 49
MAXELL. 10 each. MD-1. SS. DD	$ 55	$ 29
10 each. MD2-D. DS DD	$ 75	$ 39
MEMOREX		
10 each. SS DD. Type A (Apple. Atari)	$ 45	$ 23
10 each. DS DD. Type B (IBM. H P)	$ 60	$ 35
VERBATIM. 10 each. MD525-01. SS SD	$ 49	$ 25
10 each. MD34. DS DD	$ 84	$ 45

GENERIK™ DISKETTES – AS LOW AS $1

100 each SS. SD. 35 Track (Apple. Atari)	$ 415	$ 130
1000 each SS. SD. 35 Track (Apple. Atari)	$4150	$ 995
100 each DS. DD. 40 Track (IBM. H P)	$ 626	$ 170
1000 each DS. DD. 40 Track (IBM. H P)	$6260	$1400

W jackets. no labels. top quality 90 day limited warranty by us.



GENERIK™ DISKETTES

SS SD $1.00 Each
DS DD $1.40 Each

CDC
SS SD $1.69 Each

Minimum order quantities apply. See above money back guarantee is by COMX Corporation not us.

© 1983 by COMX Corporaton

MODEMS AND ACCESSORIES

	LIST PRICE	OUR PRICE
ANCHOR, Signalman MK I Modem (RS232)	$ 99	$ 75
Mark XII	$ 399	$ 269
HAYES, IBM-PC Smartmodem 1200 B	$ 599	$ 439
IBM-PC Smartcom II Software	$ 119	$ 89
Stack Chronograph (RS-232)	$ 249	$ 189
Stack Smartmodem 300 (RS-232)	$ 289	$ 225
Smartmodem 1200 (RS-232)	$ 699	$ 535
Micromodem 100 (S-100 bus)	$ 399	$ 275
Micromodem II (for the Apple II)	$ 379	$ 275
Apple Terminal Program	$ 100	$ 65
IBM-PC to Modem Cable	$ 39	$ 29
NOVATION, All below require RS-232		
Applecat II Modem, 300 BAUD	$ 389	$ 269
212 Apple Cat, 1200 BAUD	$ 725	$ 559
PC-Cat with Crosstalk	$ 595	$ 419
Cat	$ 189	$ 139
D-Cat	$ 199	$ 159
J-Cat	$ 149	$ 104
212 Auto Cat	$ 695	$ 579
Smart Cat 103/212	$ 595	$ 415
SSM, Transcend 1 for Apple II Data Comm.	$ 89	$ 69
ModemCard for the Apple II	$ 299	$ 259
Transmodem 1200 (110/300/1200)	$ 695	$ 559

SOFTWARE, SEE APPLE OR IBM UTILITY SOFTWARE SECTIONS

MONITORS AND ACCESSORIES

★ **AMDEK**, 12" Green, #300G	$ 200	$ 135
★ 12" Amber, #300A	$ 210	$ 149
★ 12" Amber, 310A for IBM-PC	$ 230	$ 159
★ 13" Color I, Composite	$ 379	$ 289
★ 13" Color II, RGB, Hi Res	$ 529	$ 439
DVM, Color II or III to Apple II I/F	$ 199	$ 175
NEC, 12" Green, Model JB1201M	$ 249	$ 159
12" Color, Composite, JC1215M	$ 400	$ 299
12" Color, RGB, IBM Model JC 1203	$ 699	$ 569
★ **PRINCETON**, RGB Hi Res, HX-12	$ 795	$ 499
QUADRAM, Quadchrome 12" RGB Color	$ 795	$ 499
Quadrscreen 17", 968 x 512	$1995	$1595
SANYO, 12" Green, Model DM8112CX	$ 260	$ 199
ZENITH, 12" Green, Model ZVM123 NEW!	$ 200	$ 115

PRINTERS AND ACCESSORIES

DOT MATRIX PRINTERS:

	LIST PRICE	OUR PRICE
EPSON, MX80F/T, 80 CPS, w/Graftrax +	$ 745	$ 485
FX80, CPS		Call
MX100F/T, 80 CPS, w/Graftrax +	$ 995	$ 639
FX100, CPS		Call
Apple II Graphics Dump Program	$ 15	$ 9
LEADING EDGE, Gorilla Banana	$ 250	$ 209
OKIDATA, 82A, 80 col., 120 cps, Para.	$ 549	$ 448
83A, 132 col., 120 cps, Para.	$ 899	$ 699
92, 160 CPS, 80 Col., Para.	$ 699	$ 559
93, 160 CPS, 136 Col., Para.	$1249	$ 969
2350P, Pacemark, 350 cps, Para.	$2695	$2095
2410P, Pacemark, 350 cps, Para.	$2995	$2350
ORANGE MICRO, Grappler +, for Apple	$ 165	$ 119
PRACTICAL, Microbuffer In-Line 64K, Para.	$ 349	$ 259
Microbuffer In-Line 64K Serial	$ 349	$ 259
★ **STAR MICRO.**, Gemini 10"X, 120cps, 2.3K	$ 499	$ 289
Gemini 15"X, 120cps, 2.3K	Call	Call
IBM-PC to Epson or Star Micronics Cable	$ 60	$ 35
Apple I/F and Cable for Epson or Gemini	$ 95	$ 59

LETTER QUALITY – DAISY WHEEL PRINTERS:

JUKI, 6100, 17cps, 80 Col., Parallel	$ 700	$ 539
SILVER REED, EXP550P, 18 cps, 3 pitch	$ 895	$ 615
EXP550S, 18 cps, 3 pitch	$ 995	$ 650
Tractor Feed for EXP 550	$ 160	$ 125
★ **TTX**, 13 cps, Para. & Ser, Pin & Friction	$ 649	$ 499

SUPPLIES: Tractor Feed Paper, Ribbons, Daisy Wheels.

CORVUS

6 Meg	$2095	$1695
11 Meg	$2750	$2295
20 Meg	$3750	$3095

Drives Without Interfaces
IBM-PC Interface Manual, S W & Cable Kit $ 300 $ 239
IBM-PC Omni Transporter Pack of 4 $1895 $1495
Apple Interface, Manual, S W & Cable Kit $ 300 $ 239
Other Interfaces. Omni-Net. Constellation. Mirror. CALL.

★ MEANS A BEST BUY
AD #986

ORDERING INFORMATION AND TERMS: **All Mail: P.O. Box 23068, Portland, OR 97223, Include telephone number.** All items usually in stock. Cashiers Checks, Money Orders, Fortune 1000 Checks and Government Checks, we immediately honor. Personal or other Company Checks allow 20 days to clear. No. C.O.D. Prices reflect a 3% cash discount so ADD 3% to above prices for VISA or MC. For U.S. Mainland, add 3% for shipping, insurance and handling (SI&H) by UPS with $5 minimum for SI&H. UPS ground is standard so add 3% more for UPS Blue with $10 minimum for SI&H. Add 12% total for SI&H for US Postal, APO or FPO with $15 minimum for SI&H. For Hawaii, Alaska and Canada, UPS is in some areas only, all others are Postal so call, write, or specify Postal. Foreign orders except Canada for S,I&H add 18% or $25 minimum for SI&H except for monitors add 30% or $50 minimum for SI&H. Prices subject to change and typo errors, so call to verify. All goods are new, include warranty and are guaranteed to work. Due to our low prices, ALL SALES ARE FINAL. Call before returning goods for repair or replacement. Orders received with insufficient S,I&H charges will be refunded. ORDER DESK HOURS 6 A.M. to 6 P.M. PST, Monday through Friday and 10 to 4 Saturday. 6 A.M. here is 9 A.M. in New York.

OUR REFERENCES: We have been in computers and electronics since 1958, a computer dealer since 1978 and in computer mail order since 1980. Banks: 1st Interstate Bank, (503) 643-4678. We belong to the Chamber of Commerce (503) 644-0123, Better Business Bureau and Direct Marketing Association, or call Dunn and Bradstreet if you are a subscriber. Fastrak™ and Generik™ are trademarks of ComX Corporation. WordStar, MailMerge, StarIndex, InfoStar, are trademarks of MicroPro.

CASH & CARRY OUTLETS:
Over-the-counter sales only. Open Monday through Saturday 10:00 until 5:00.

PORTLAND, OREGON, 11507-D S.W. Pacific Hwy, Terrace Shopping Center. Tigard. On 99W between 217 and I-5. Call 245-1020.

SEATTLE, WASH., 3540 128th Ave. SE. Bellevue, WA 98006. Tele.: 641-4736, in Loehmann's Plaza near Factoria Square, SE of Hwy. 405 & 90 and at SE 38th & Richards.

Professionals™

DEALERS WE BUY EXCESS INVENTORIES

LOW PRICES TO PROFESSIONALS WHO KNOW WHAT THEY WANT AND KNOW HOW TO USE IT!

THE IBM-PC SUPPLY CENTER

IBM is a trademark of IBM Corporation.

256K
IBM-PC
System Includes
Two 320K Disk Drives by CDC
90 Day Warranty By Us
Call For Details And
Configurations

		LIST PRICE	OUR PRICE
MEMORY CHIP KITS	Add-on to your memory cards or mother board. 100% tested. With 90 day warranty.		
★	64K Kit, 200NS, 9 chips, 4164	$ 150	$ 45
	16K Kit, 200NS, 9 chips, 4116 (for PC-1 motherboard)	$ 50	$ 16
AMDEK	4-IN-1 Multiple Board, Color Graphics, Mono, 128K	$ 599	$ 519
AST	ComboPlus, 64K S/P/C	$ 395	$ 279
	ComboPlus, 256K, S/P/C	$ 695	$ 475
	MegaPlus II, 64K, 2-S/P/C	$ 495	$ 345
	MegaPlus II, 256K, 2-S/P/C	$ 795	$ 495
	256K MegaPlus II Expander	$ 395	$ 295
	SixPakPlus, 64K, S/P/C	$ 395	$ 295
	SixPakPlus, 256K, S/P/C	$ 695	$ 495
	SixPakPlus, 384K, S/P/C	$ 895	$ 595
	I/O Plus II, 2S/P/C/G	$ 315	$ 195
	PCnet™ LAN Kit	$1490	$1290
CCS	SuperVision, monochrome board	$ 850	$ 680
	Z/Plus 64, fast Z80B, 64K para port	$ 875	$ 695
★ **ComX**	256K RAM Card with Fastrak™ RAM disk emulator and spooler software.	$ 695	$ 256
CURTIS	PC Pedestal™ for Display	$ 80	$ 65
	3 to 9 foot keyboard cable	$ 50	$ 35
	Vertical CPU "System Stand"	$ 25	$ 19
	Monochrome Ext. Cable Pair	$ 40	$ 30
HERCULES	Monochrome Board	$ 499	$ 379
Key Tronic	KB5150, Std. keyboard	$ 269	$ 199
Koala	Koala Pad™	$ 150	$ 109
	Programmer's Guide	$ 15	$ 12
MAYNARD	Multifunction (6) Card, MFC	$ 89	$ 79
	Modules for above card		Call
	SandStar, no RAM card	$ 199	$ 169
	SandStar, 256K Card	$ 499	$ 395

		LIST PRICE	OUR PRICE
MICROSOFT	RAMCard 256K	$ 550	$ 385
	SystemCard 256K	$ 395	$ 275
	SystemCard 64K	$ 625	$ 435
	Mouse	$ 195	$ 145
MOUSE SYSTEMS	PC Mouse w/software	$ 295	$ 195
ORCHID	PCnet™, LOCAL AREA NET	$1490	$1190
	Monochrome Graphics Card	$ 499	$ 379
PLANTRONICS	ColorPlus, 16 color brd. w/Para Port	$ 475	$ 379
QUADRAM			
★	Quadlink, Apple II Emulator	$ 680	$ 485
	Quadboard, no RAM, expandable to 256K	$ 295	$ 215
	Quadboard 64K, expandable to 256K	$ 395	$ 279
★	Quadboard 256K, 6 function	$ 595	$ 395
	Quadboard II, no RAM, expand to 256K	Call	Call
	Quadboard II, 64K, expandable to 256K	$ 395	$ 285
	Quadboard II, 256K, 6 function	$ 595	$ 395
	Quad 512+, 64K plus serial port	$ 325	$ 265
	Quad 512+, 256K plus serial port	$ 550	$ 420
	Quad 512+, 512K plus serial port	$ 895	$ 625
	Quadcolor I, board, 16 colors	$ 295	$ 225
	Quadcolor II, board, use with Quadcolor I	$ 275	$ 209
	Quadchrome, 12" RGB Monitor	$ 795	$ 499
	Quadscreen, 17", 968 x 512 Monitor	$1995	$1595
	Microfazer, w/Copy, P/P, 8K, #MP8 w/P.S.	$ 189	$ 129
	Microfazer, w/Copy, P/P, 64K, #MP64 w/P.S.	$ 319	$ 219
	Microfazer, w/Copy, P/P, 128K, #MP128 w/P.S.	$ 465	$ 295
	Microfazer, Snap-on, 8K, P/P, Epson, #ME8, w/P.S.	$ 179	$ 145
	Microfazer, Snap-on, 64K, P/P, Epson, #ME64, w/P.S.	$ 319	$ 235
	All Microfazers are expandable, (w/copy to 512K) (Snap-on to 64K)		
Tecmar	1st MATE, 64K	$ 389	$ 295
	1st MATE, 256K	$ 589	$ 439
	Graphics Master		Call
TG PRODUCTS	Joystick	$ 65	$ 49
WICO	IBM-PC Mouse	$ 100	$ 69

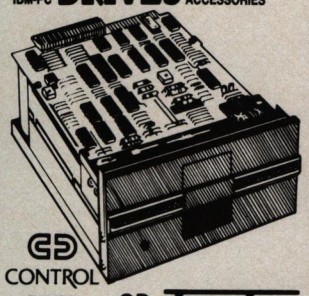
$45 $40 Ten or more.
64K CHIP KIT
9 Each 4164, 200 ns, MEMORY EXPANSION.
90 Day Warranty by us.

$256 $239 Two or more.
256K RAM BOARD
Fully Compatible. 2 Year Limited Warranty by ComX.
With Fastrak RAM/Disk Emulator and Spooler Software.
Works on DOS 1.1 or 2.0.

★ Means a BEST buy.

AD #986

for the IBM-PC **DRIVES** AND ACCESSORIES



CONTROL DATA **OR** Tandon
320K/360K DS DD DISK DRIVES
With Detailed Installation Instructions
60 Day Warranty by Factory Authorized Distributor

Same as now installed by IBM. **$229** $239 For One.

$199
HALF HEIGHT

	LIST PRICE	OUR PRICE
MAYNARD		
Floppy Drive Control Brd. for up to 4 drives	$ 195	$ 165
same with Parallel Port	$ 275	$ 205
RANA 2.5 Meg 5" Drive System (Jan)	$1550	$1195
25 Meg Hard Disk System		Call
QUADISK 6 Meg, Removable	$2295	$1795
CALL ON AVAILABILITY 6 Meg, Fixed	$1995	$1595
12 Meg, Fixed	$2250	$1750
20 Meg, Fixed	$2650	$2050
27 Meg, Fixed	$2895	$2295
72 Meg, Fixed	$6500	$4950
VISTA IBM-PC XT 6MB Backup for Hard Disk, V1200	$1549	$1049

SOFTWARE for the IBM-PC or XT

BUSINESS

		LIST PRICE	OUR PRICE
ASHTON-TATE			
★	dBase II, requires PC-DOS & 128K	$ 700	$ 385
	dBase II User's Guide	$ 30	$ 20
	Everyman's DB Primer (Book)	$ 15	$ 12
	The Financial Planner	$ 700	$ 395
	Friday	$ 295	$ 199
APPLIED SOFT. TECH.	Versaform	$ 389	$ 265
★ **CONTINENTAL**	Home Accountant +	$ 150	$ 89
	FCM (Filing, Cataloging, Mailing)	$ 125	$ 89
	Property Management	$ 495	$ 329
DATAMOST	Write-On (Word Processor)	$ 130	$ 89
DOW JONES	Market Analyzer	$ 350	$ 279
	Market Manager	$ 300	$ 239
	Market Microscope	$ 700	$ 525
EAGLE SOFTWARE	Money Decisions	$ 150	$ 129
★ **EINSTEIN**	Writer NEW!	$ 300	$ 199
	Memory Trainer NEW!	$ 80	$ 55
	Speller NEW!	$ 150	$ 95
	Mailer NEW!	$ 80	$ 55
	Letter Scenes NEW!	$ 300	$ 195
FOX & GELLER	Quickcode (MSDOS)	$ 295	$ 179
	dGraph (MSDOS)	$ 295	$ 179
	dUtil for IBM PC DOS	$ 99	$ 59
HAYDEN	IBM Pie Writer	$ 200	$ 135
	Pie: Speller	$ 100	$ 69
HOWARDSOFT	Real Estate Analyzer II	$ 250	$ 189
INFOR. UNLIMITED	EasyWriter II (WP)	$ 350	$ 259
	EasySpeller II	$ 225	$ 149
	EasyFiler (a DBMS)	$ 400	$ 299
	Inventory Control	$ 595	$ 395
★ **INSOFT**	Data Design (easy to use DBMS)	$ 225	$ 169
	Data Base Made Easy (Book)	$ 17	$ 12
LIFETREE	Volkswriter	$ 285	$ 195
★ **LOTUS**	1-2-3	$ 495	$ 329
MICROCRAFT	Verdict or Billkeeper, each	$ 995	$ 469
MICRO LAB	Miner 2049	$ 40	$ 29
MICROPRO	WordStar®	$ 495	$ 239
	Mail Merge™	$ 250	$ 129
	SpellStar™	$ 250	$ 129
★	WordStar Professional, 4 Pak	$ 895	$ 429
	StarIndex™	$ 195	$ 109
	InfoStar™	$ 495	$ 259
	Report Star™	$ 350	$ 199
	DataIndex™	$ 295	$ 195
	StarBurst™	$ 195	$ 115
★ **MICROSOFT**	Multiplan	$ 275	$ 175
	Word	$ 375	$ 275
	Word with Mouse	$ 475	$ 339
	Financial Statement	$ 100	$ 69
	Budget	$ 150	$ 109

BUSINESS

		LIST PRICE	OUR PRICE
MONOGRAM	Dollars & Sense	$ 165	$ 110
NORTH AMERICAN BUS.	The Answer	$ 250	$ 169
★ **OSBORNE/COMX**	(Book & Business, Statistics & Math Programs on DS/DD Disks)		
	Some Common Basic Prog. (70 each)	$ 100	$ 69
	Practical Basic Programs (40 each)	$ 100	$ 69
PBL CORPORATION	Personal Investor	$ 145	$ 94
PEACHTREE	Peach Pak 3 (GL, AR & AP)	$ 595	$ 239
	Peach Text 5000	$ 395	$ 239
PEARLSOFT	Personal Pearl (DBMS & MIS)	$ 295	$ 195
★ **PERFECT**	Perfect Writer™	$ 389	$ 149
	Perfect Speller™ or Perfect Calc™, each	$ 295	$ 99
	Writer + Speller, 2 Pak	$ 695	$ 199
	Perfect Filer™	$ 595	$ 199
SOFTWARE ARTS	TK! Solver	$ 299	$ 219
SOFTWARE PUBLISHING	PFS:File	$ 140	$ 94
	PFS:Report	$ 125	$ 84
	PFS:Write NEW!	$ 140	$ 95
	PFS:Graph NEW!	$ 140	$ 95
SORCIM	SuperCalc II	$ 295	$ 195
	SuperWriter	$ 295	$ 199
SSI/SATELLITE	WordPerfect	$ 495	$ 375
	Personal WordPerfect	$ 195	$ 149
STC/SOFTEC	The Creator	$ 300	$ 195
STONEWARE	D.B. Master (a DBMS)	$ 596	$ 396
SYNAPSE	File Manager	$ 100	$ 67
SYNERGISTIC	Data Reporter	$ 250	$ 169
T/MAKER	T/Maker III	$ 275	$ 169
VISICORP	VisiCalc/256K or Visidex, each	$ 250	$ 179
	VisiFile or VisiSchedule	$ 300	$ 219
	Desktop Plan I	$ 300	$ 219
	VisiWord with VisiSpell (128K)	$ 375	$ 269

UTILITY & SYSTEM

1983 CL SOFTWARE AWARD:
"Copy II PC by Central Point Software is still the best software buy of 1983 and 1984. It will copy more copy protected software and faster than any other backup system. Unlike other copiers it makes an exact duplicate of your original and it does 100% verification of copy. Documentation is excellent."

★ **CENTRAL POINT**	Copy II PC. Backup	$ 40	$ 35
★ **COMX**	Fastrak™, RAM Disk emulator and printer spooler program. Works on any PC DOS version or RAM Card. Menu Driven. NEW!	$ 100	$ 59

UTILITY & SYSTEM

		LIST PRICE	OUR PRICE
DIGITAL RESEARCH			
	Concurrent CP M-86™	$ 350	$ 225
	CBASIC 86™	$ 200	$ 135
	CP M-86™	$ 60	$ 40
	Pascal MT+ (CP M-86)	$ 400	$ 169
	Pascal MT+ (MSDOS)	$ 600	$ 399
	PL I (MSDOS)	$ 750	$ 499
	Access Manager (MSDOS)	$ 400	$ 179
	Display Manager (MSDOS)	$ 500	$ 339
	Speed Prog. Pkg. (CP M-86)	$ 200	$ 135
	CIS COBOL-86	$ 850	$ 525
	DR LOGC-86	$ 150	$ 90
	CBASIC Compiler (86 or MSDOS, each)	$ 600	$ 365
HAYES	Smartcom II (Data Comm.)	$ 119	$ 89
MICROCOM	Microterminal (Data Comm.)	$ 100	$ 65
MICROSTUF, Crosstalk XVI (Hayes & IBM)		$ 195	$ 129
MICROSOFT	muMath muSimp	$ 300	$ 225
	Business BASIC Compiler	$ 600	$ 450
	Pascal Compiler	$ 350	$ 255
	C Compiler	$ 350	$ 225
	BASIC Compiler	$ 395	$ 285
	Fortran Compiler	$ 350	$ 255
	COBOL Compiler	$ 750	$ 559
	BASIC Interpreter	$ 350	$ 255
NORTON	Norton Utilities: 14 programs	$ 80	$ 65

HOME & EDUCATIONAL

		LIST PRICE	OUR PRICE
EPYX/Auto. Sim.	Temple of Apshai	$ 40	$ 29
	Oil Barons	$ 100	$ 75
★ **ARMONK**	Executive Suite	$ 40	$ 27
BLUE CHIP	Millionaire or Tycoon, each	$ 60	$ 39
BPI SYSTEMS	Personal Accounting	$ 195	$ 139
★ **BRODERBUND**	Apple Panic (Color)	$ 30	$ 19
COMPREHENSIVE	PC Tutor (DOS 1.1)	$ 60	$ 40
CONTINENTAL	Home Accountant +	$ 150	$ 89
DATAMOST	Pig Pen or Space Strike, ea.	$ 30	$ 22
DAVIDSON	The Speed Reader II	$ 75	$ 49
INFOCOM	Deadline	$ 50	$ 33
	Zork I or Zork II or Zork III, ea.	$ 40	$ 27
★ **INSOFT**	Word Trix or Quotrix, each NEW!	$ 35	$ 29
MICRO LAB	Miner 2049	$ 40	$ 29
MICROSOFT	Flight Simulator	$ 50	$ 33
MONOGRAM	Dollars & Sense	$ 165	$ 110
PBL CORP.	Personal Investor	$ 145	$ 99
SPINNAKER	Snooper Troops (1 or 2)	$ 45	$ 35
	Story Machine or Face Maker	$ 35	$ 24
STRATEGIC	the Warp Factor	$ 40	$ 30
SUBLOGIC	Night Mission Pinball	$ 40	$ 27

THE WORLD'S LARGEST COMPUTER MAIL ORDER FIRM

CONROY-LA POINTE™

VISA master charge

Formerly **Computer Exchange™**

SHOWROOMS AT: PORTLAND, OR. or SEATTLE, WA. BOTH OPEN M-SAT 10-5
ALL MAIL: P.O. BOX 23068, Portland, Or. 97223

NATIONAL ORDER DESK **TOLL FREE (800) 547-1289**
Order Desk Hours: 6AM to 6PM PST

Oregon TOLL FREE	Hot Line For Information
[800] 451-5151	On Your Order
Portland: 245-6200	[503] 245-1030

CIRCLE 129 ON READER SERVICE CARD

Introducing the first computer games that pay you to own them.

Virtually all computer games provide entertainment value.

These new games from Blue Chip also give you practical value—of the most rewarding kind.

They put you in high-powered, real-world environments. Where you create strategies. React to constantly changing conditions. And learn solid skills in competing for extraordinary payoffs:

Millionaire™ You build a portfolio of actual NYSE companies, whose fortunes are tied to a universe of plausible events and variables to consider. Over 300,000 possible combinations of events mean you can play a lifetime without a repeat.

Baron™ Buy and sell all manner of real estate nationwide as you strive to amass a personal empire. Factors include realistic property values, overall economy and local idiosyncrasies.

Tycoon™ If gold, silver, foreign currencies or other commodities quicken your pulse, play Tycoon and learn the ins and outs of this most volatile of financial arenas.

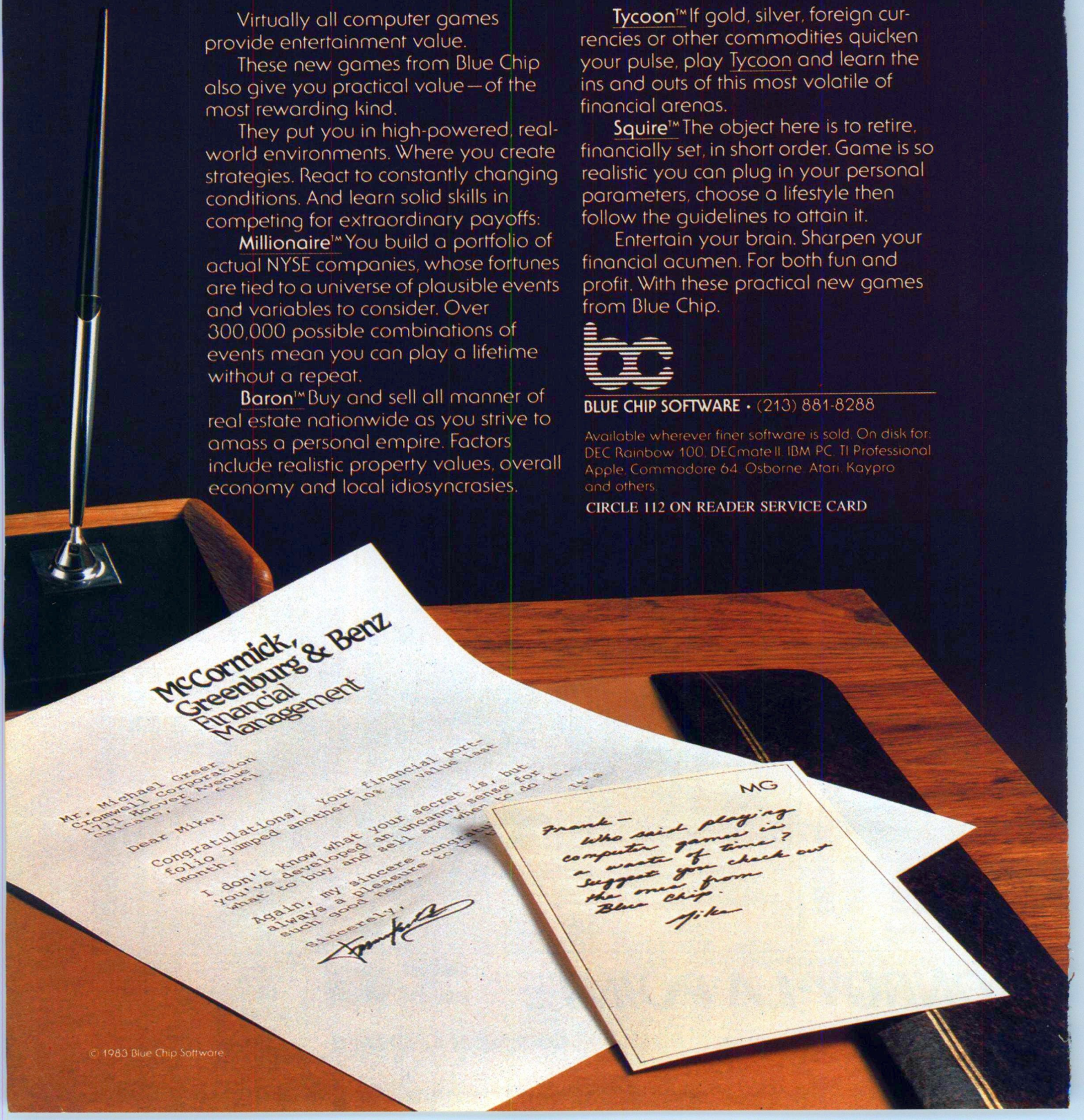
Squire™ The object here is to retire, financially set, in short order. Game is so realistic you can plug in your personal parameters, choose a lifestyle then follow the guidelines to attain it.

Entertain your brain. Sharpen your financial acumen. For both fun and profit. With these practical new games from Blue Chip.

BLUE CHIP SOFTWARE • (213) 881-8288

Available wherever finer software is sold. On disk for: DEC Rainbow 100, DECmate II, IBM PC, TI Professional, Apple, Commodore 64, Osborne, Atari, Kaypro and others.

CIRCLE 112 ON READER SERVICE CARD



© 1983 Blue Chip Software

COMPUTERIZED INVESTING

Computers needn't just cost you money—they can also help you make money, the old-fashioned way, by pointing you at the proper stocks and bonds.

And you don't have to struggle on alone in your investment plans. A publication which is produced by the American Association of Individual Investors, *Computerized Investing*, aids and abets your search for hot stocks with its evaluations of investment software, hardware appraisals, and new-product descriptions.

This newsletter, which goes to approximately 11,000 subscribers, offers the advantages of an electronic bulletin board, which can upload or download investment-related programs, software and message exchanges for subscribers, and a disk packed with 15 public-domain Apple-compatible investment enhancers (this last one costs $10 extra).

Editor Norm Nicholson said that as of the publication's latest membership survey in December 1982, 33% of its readers used Apple equipment; the next nearest was the IBM PC at 6%.

For further information on *Computerized Investing*, contact the newsletter offices at Suite 317, 612 North Michigan Avenue, Chicago, IL 60611. The access number for the electronic bulletin board is (312) 280-8764.

PASSWORD: JOSHUA

Teenagers no longer have to hunt through lists of computer-access lines to link with the Department of Defense's military-strategy computer, as did the hero of the movie *WarGames*. Now the missile bases, numbers of survivors, and lists of possible scenarios are all cataloged in a new game called Strategic Nuclear War.

Dr. William Martel, a defense analyst at Abt Associates in Cambridge, Massachusetts, and Dr. Paul Savage, chair of the political-science department at St. Anselm's College in Manchester, New Hampshire, codeveloped the "game" to help people clearly understand the effects of a nuclear attack.

Data for the game was laboriously compiled from unclassified technical journals, manuals, books, and the authors' own knowledge. The software, written in BASIC, lets users update and edit the database to fit current geopolitical moves.

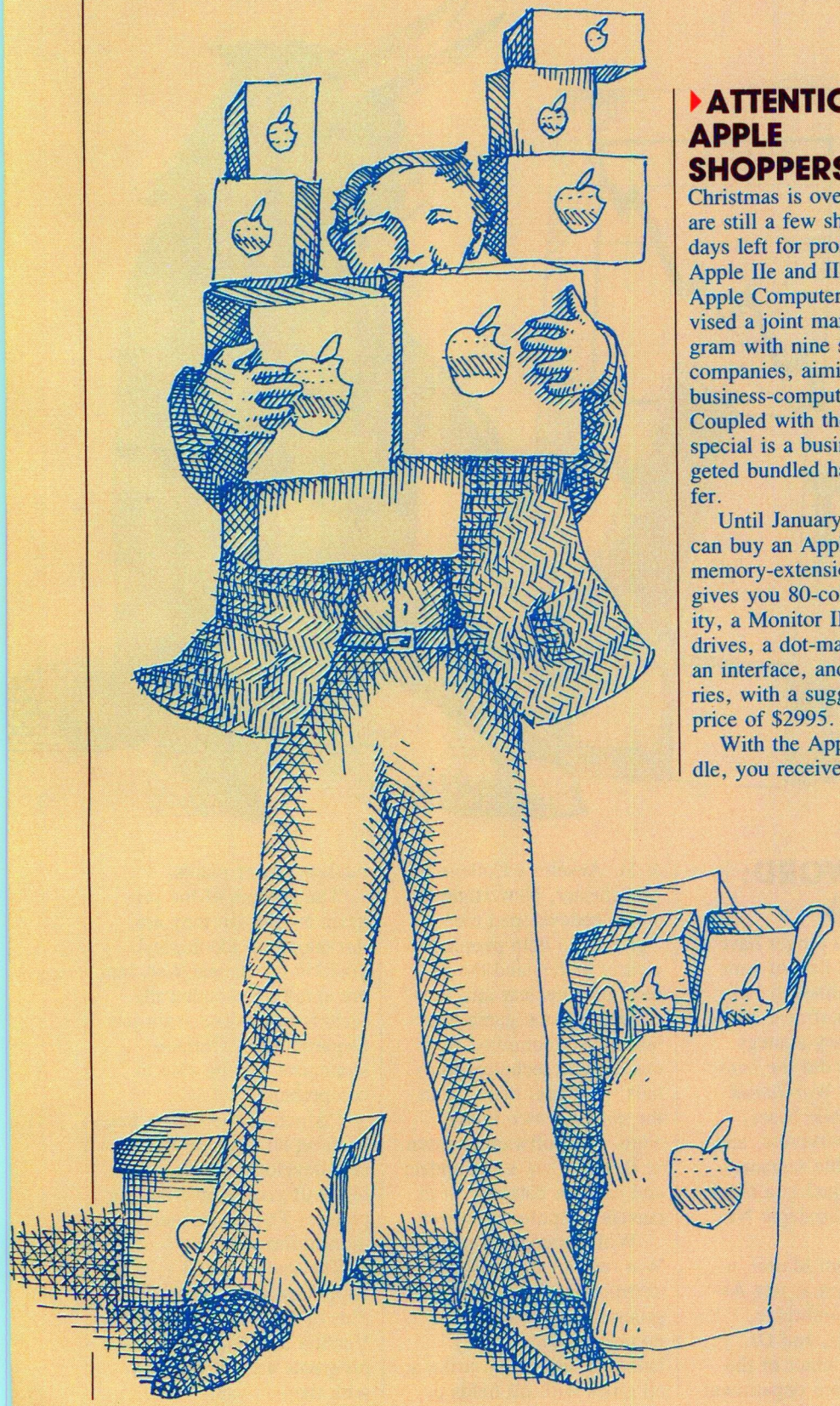
With Strategic Nuclear War, users can assess the destruction if their city is at ground zero or tot up the number of dead if they launch a retaliatory strike at all cities with oil fields or nuclear power plants.

The authors of the program emphasize they are *not* taking an ideological position on nuclear war, but are simply presenting the facts for everyone—not just Department of Defense strategists—to be able to comprehend.

"Much of the debate has been on an intuitive level," said developer Martel, "but this will give people the big picture. They'll be much more informed."

The game, slated to cost $50, runs on an Apple II Plus or IIe with Apple DOS Version 3.3. Tic-tac-toe programs are not bundled with the software.

A+ DISPATCHES



ATTENTION, APPLE SHOPPERS!

Christmas is over, but there are still a few shopping days left for prospective Apple IIe and III buyers. Apple Computer has devised a joint marketing program with nine software companies, aiming at small-business-computer users. Coupled with the software special is a business-targeted bundled hardware offer.

Until January 15, you can buy an Apple IIe with a memory-extension card that gives you 80-column capacity, a Monitor II, two disk drives, a dot-matrix printer, an interface, and accessories, with a suggested retail price of $2995.

With the Apple III bundle, you receive a Monitor III, a ProFile hard-disk drive with Catalyst 2.0 (a new version of Quark's Selectra software), and a tutorial for the Apple III system utilities, all for $5330. Unlike the IIe bundle, the Apple III deal is a permanent offering on the price list.

COMPUTER COLLECTIBLES

If someone can make it, someone can collect it, and computers are no exception. Yes, a market is burgeoning for computer collectibles—we can't say antiques yet, since antiques are defined as being at least 100 years old. But computer nostalgia is just around the corner.

Meanwhile, rummage through the attic of a nearby computer buff and see if he or she tucked away a few of the following:

- The 1888 Burroughs calculator. This 99-day wonder, the forerunner of today's computers, was the first to print out entries and results on paper. Twenty dollars from a junk shop, hundreds of dollars from a collector.
- The first floppy disk. Invented by IBM for loading programs into computers, a genuine 1972 floppy would have the IBM label, name, and serial number. These probably cost only a few dollars, for now.
- The 1976 Apple I. These gray-bearded machines are few and far between, because of Apple's generous trade-in offers when the Apple II burst onto the scene. Prices could range from $50 to $500 or more.

COMPUTE FOR HEALTH

How long will you live? How healthy are you? A doctor's visit, complete with concomitant parking problems and half-hour penance in the waiting room, is no longer necessary to help you gauge your general fitness level.

A battery of programs from HRM Software, a division of Human Relations Media in Pleasantville, New York, can help you foster good health practices as well as many clinics can—in fact, these programs have found their way into many clinics.

The Health Awareness Games disk runs on the Apple I, II Plus, and IIe with DOS 3.3 and sells for $99 retail.

Its five programs include Coronary Risk, Why Do You Smoke?, Exercise/Weight, Life Expectancy, and Lifestyle. (Remember that these programs can't substitute for a doctor's care, but are merely health guides.)

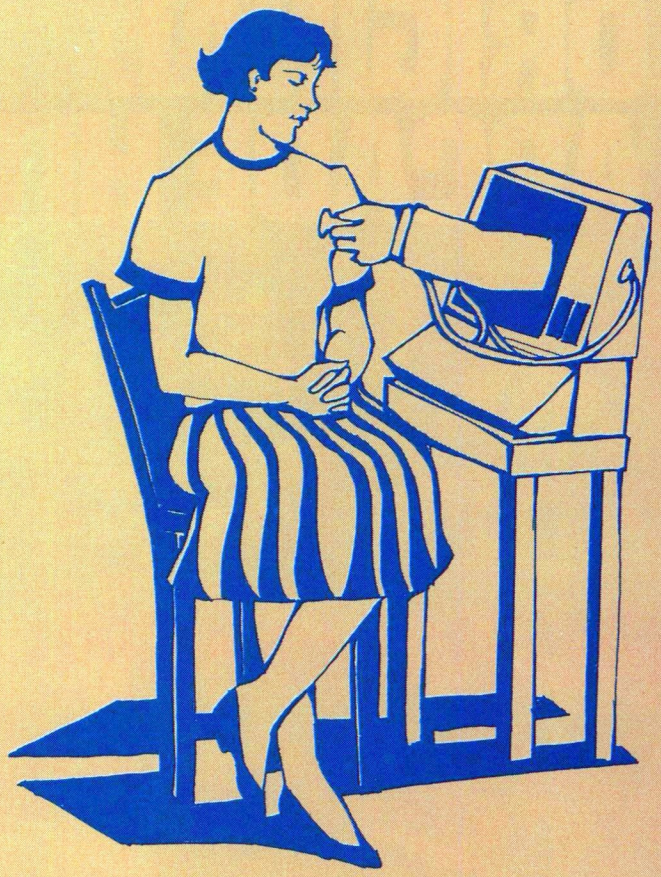
In return for your embarrassingly honest answers to its appropriately nosy questions, The Health Awareness programs will give you sound, common-sense advice on better eating habits, exercise, stress, and the results of your current excesses.

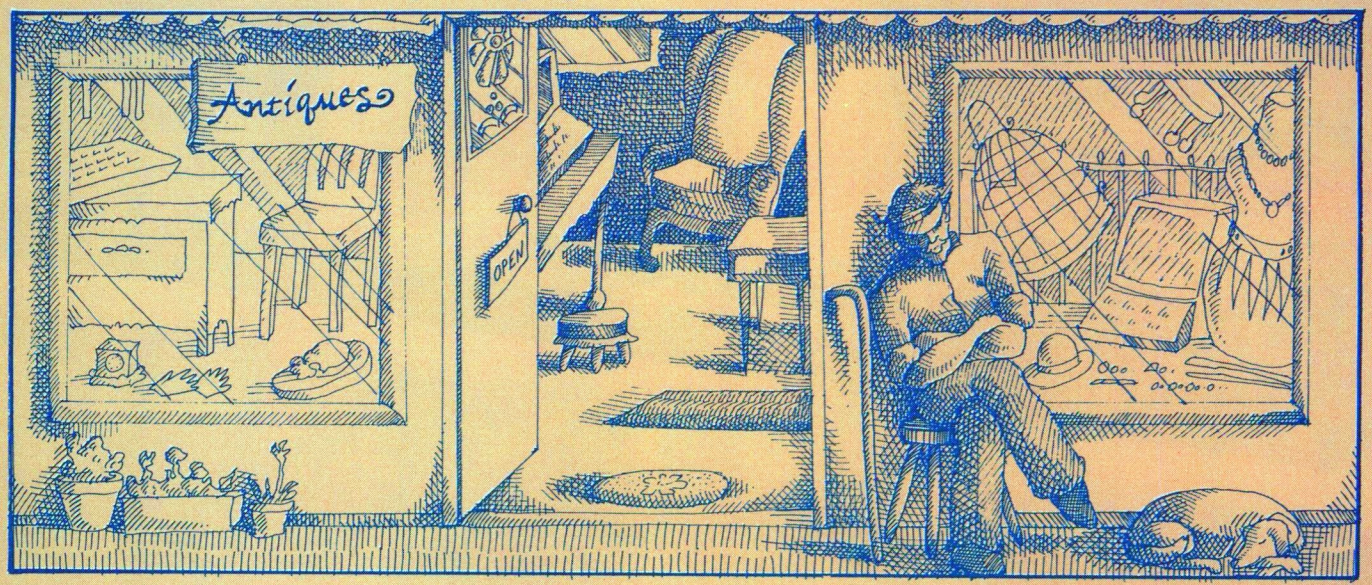
Tell the truth, now, or HRM will sick [sic] its Experiments in Human Physiology hardware/software package on you. This combo for Apple II computers measures your body's response time, skin temperature, and respiration; in other words, it can act as a polygraph.

A GOOD STORY IS HARD TO FIND

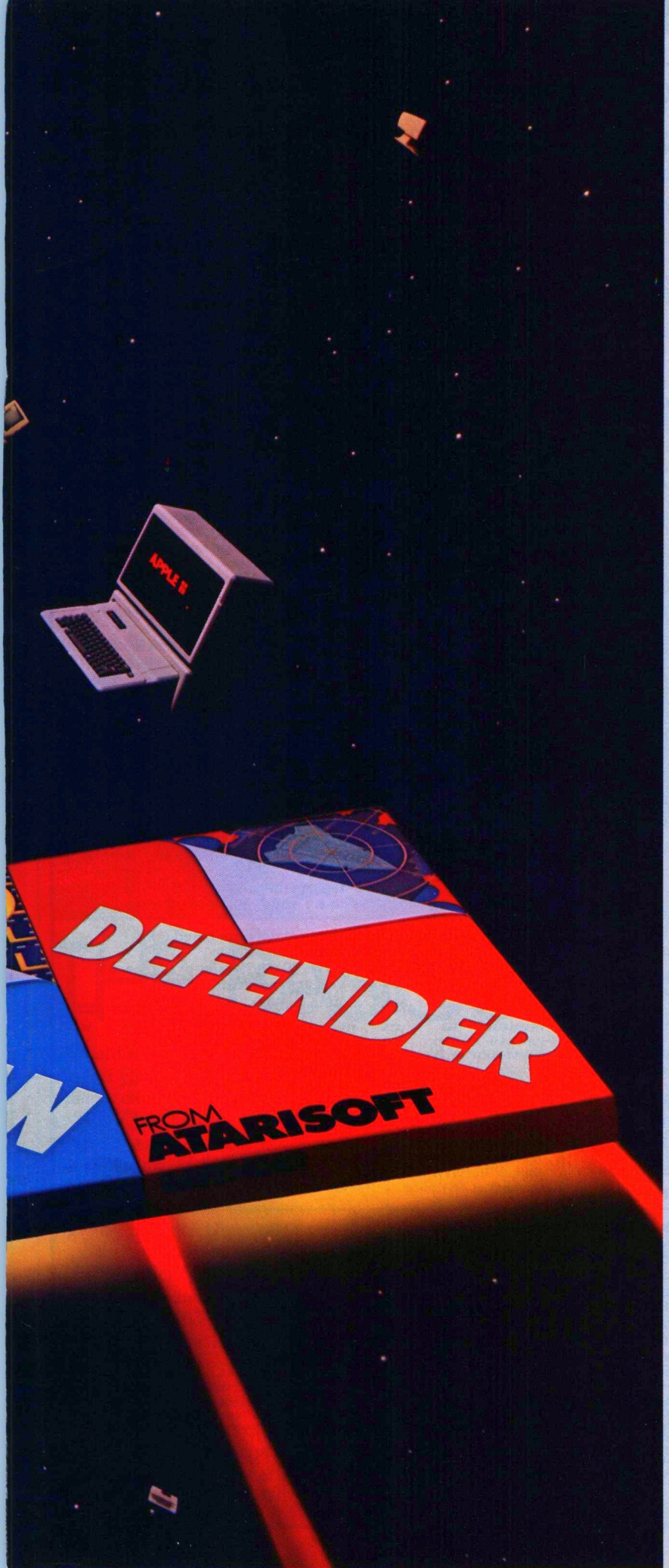
Which is why *A+* is willing to pay up to $50 for every morsel of news, hot gossip, or intriguing computer stories we can use in these pages. You must include your name, address, and telephone number with each tidbit.

All submissions become the property of *A+* magazine and are subject to editing. Please direct your data to Dispatches, c/o *A+* magazine, 1 Davis Drive, Belmont, CA 94002.





NOW YOUR COMPUTER FITS THE ORIGINAL ARCADE HITS.



Now the excitement of original arcade graphics and sound effects comes home to your computer.

Introducing ATARISOFT.™ A new source for computer software.

If you own a Commodore VIC 20 or 64, a Texas Instruments 99/4A, an IBM or an Apple II, you can play the original arcade hits.

DONKEY KONG by Nintendo, CENTIPEDE,™ PAC-MAN, DEFENDER, ROBOTRON: 2084, STARGATE and DIG DUG. (On the TI 99/4A you can also play Protector II, Shamus, Picnic Paranoia and Super Storm.)

So, start playing the original hits on your computer.

Only from ATARISOFT.

Some games also available on ColecoVision and Intellivision.

ATARISOFT™

Now your computer fits the arcade hits.

DONKEY KONG, Mario and NINTENDO are trademarks and © Nintendo 1981, 1983. PAC-MAN and characters are trademarks of Bally Midway Mfg. Co. sublicensed to Atari, Inc. by Namco-America, Inc. DEFENDER is a trademark of Williams Electronics, Inc., manufactured under license from Williams Electronics, Inc. ROBOTRON: 2084 is a trademark and © of Williams 1982, manufactured under license from Williams Electronics, Inc. STARGATE is a trademark and © of Williams 1981, manufactured under license from Williams Electronics, Inc. DIG DUG is created and designed by Namco Ltd. manufactured under license by Atari, Inc. Trademarks and © Namco 1982. PROTECTOR II is a trademark of Synapse Software Corporation, manufactured under license by Atari, Inc. SHAMUS is a trademark of Synapse Software Corporation, manufactured under license by Atari, Inc. PICNIC PARANOIA is a trademark of Synapse Software Corporation, manufactured by Atari, Inc. SUPER STORM is engineered and designed by Synapse Software Corporation, manufactured under license by Atari, Inc. ATARISOFT™ products are manufactured by Atari, Inc. for use on the above referenced machines and are not made, licensed or approved by the manufacturers of these machines. COMMODORE 64, VIC 20, TEXAS INSTRUMENTS 99/4A, IBM, APPLE, COLECOVISION and INTELLIVISION are respectively trademarks of Commodore Electronics Limited, Texas Instruments, International Business Machines Corp., Apple Computer, Inc., Coleco Industries, Inc. and Mattel, Inc. A Warner Communications Company.
© 1983 Atari, Inc. All rights reserved.

Complete this coupon and we'll keep you up to date on the newest hits from ATARISOFT.™

Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____

PRODUCT OWNED: (Check one)

1 ☐ TI-99/4A
2 ☐ IBM PC
3 ☐ Commodore 64
4 ☐ ColecoVision
5 ☐ Commodore Vic 20
6 ☐ Intellivision
7 ☐ Apple II
8 ☐ _____

Mail to:
Atari, Inc., P.O. Box 2943,
So. San Francisco, CA 94080.

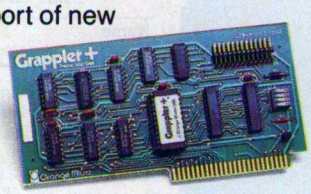
ASM 1

CIRCLE 262 ON READER SERVICE CARD

Satisfying More Than With Innovation

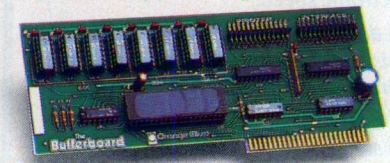
Grappler™ + Printer Interface

The Original Apple® graphics printer interface. Since its introduction three years ago, the Grappler has been imitated by many, but never matched. Now with exclusive features for the Apple IIe and full support of new Epson® graphics, the Grappler + remains the most intelligent interface available. Over twenty-seven commands give Apple users full control over any graphics or text on the Apple screen, including a new 80 column text dump. Performance, relia-

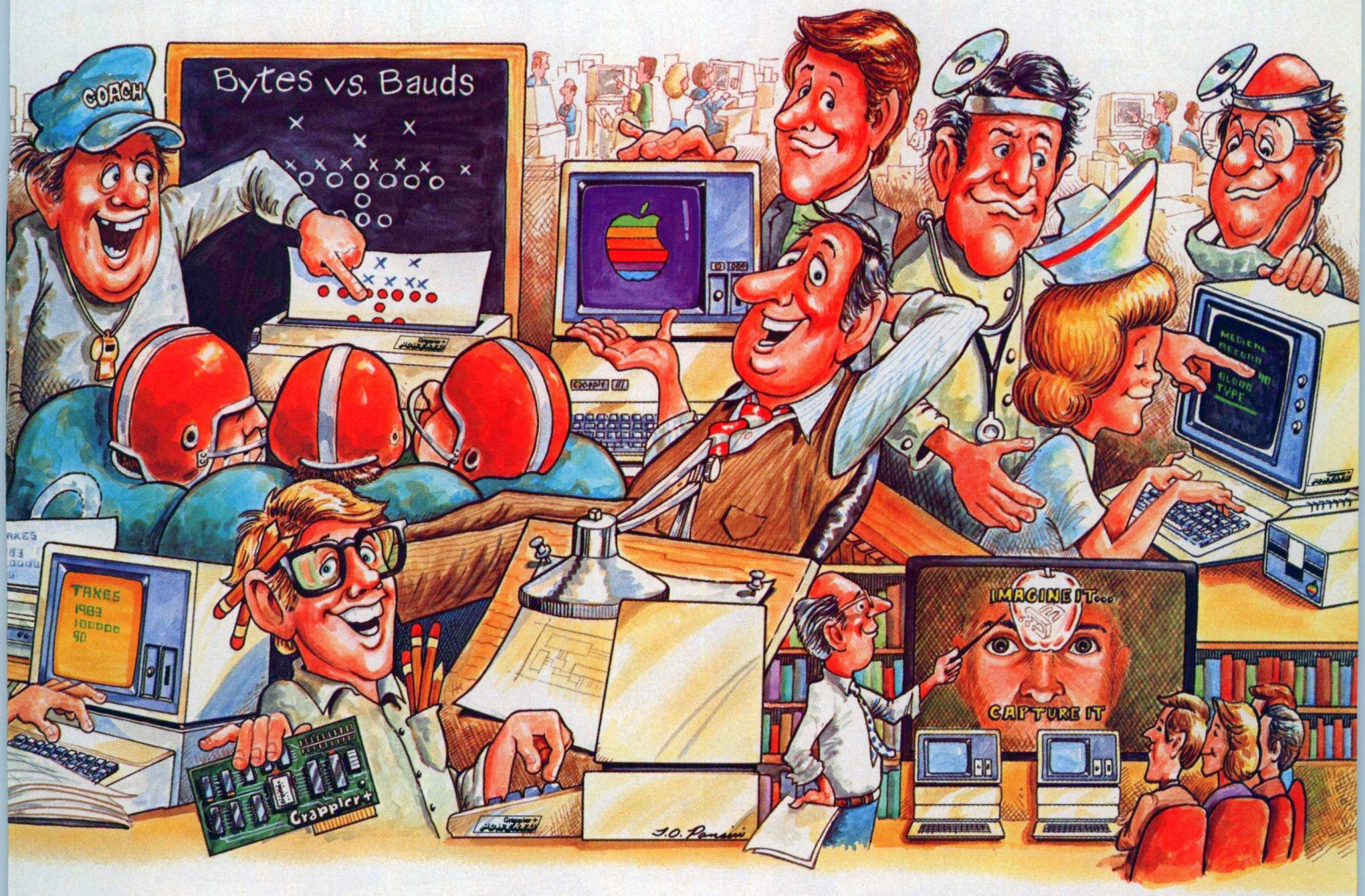


Bufferboard™ For Apples and Printers

The innovator in "dock-on" printer buffering. The Bufferboard easily adds memory to your current Apple interface system, freeing your computer for additional input. Easily upgradable from 16K, the Bufferboard can store up to 20 pages of text. It fits neatly inside your Apple, "docking" onto your existing printer interface.* No clumsy boxes or cables, no external power supplies…just convenience and economy. With the Bufferboard, you might never wait for your printer again.

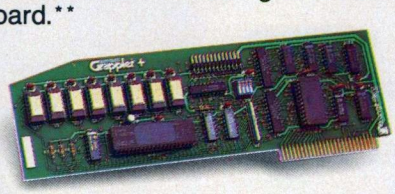


135,000 Apple® Owners And Excellence.



BUFFERED Grappler™ +

The most sophisticated buffered Apple printer interface available. The New Buffered Grappler + combines the industry leading features of the Grappler + with the time saving economies of the Bufferboard.**



With this much interface power, you'll never need anything else. And the price will surprise you, too.

**Not available for IDS printers.
Apple is a registered trademark of Apple Computers, Inc.
Epson is a registered trademark of Epson America Inc.

Over 135,000 Apple® computers are using Orange Micro products. Innovation and excellence have made us the #1 manufacturer of intelligent printer interfaces. The top selling Grappler + has become an industry standard, recommended by more software houses and Apple dealers.
To meet your growing needs, Orange Micro will continue to introduce new products. Recent innovations include the Grappler + for IDS color printers and the new Orange Interface, with text screen dumps and formatting at a low price.
There is an Orange Micro product designed for your application.
For a complete demonstration, see your Apple dealer today.

Orange Micro inc.

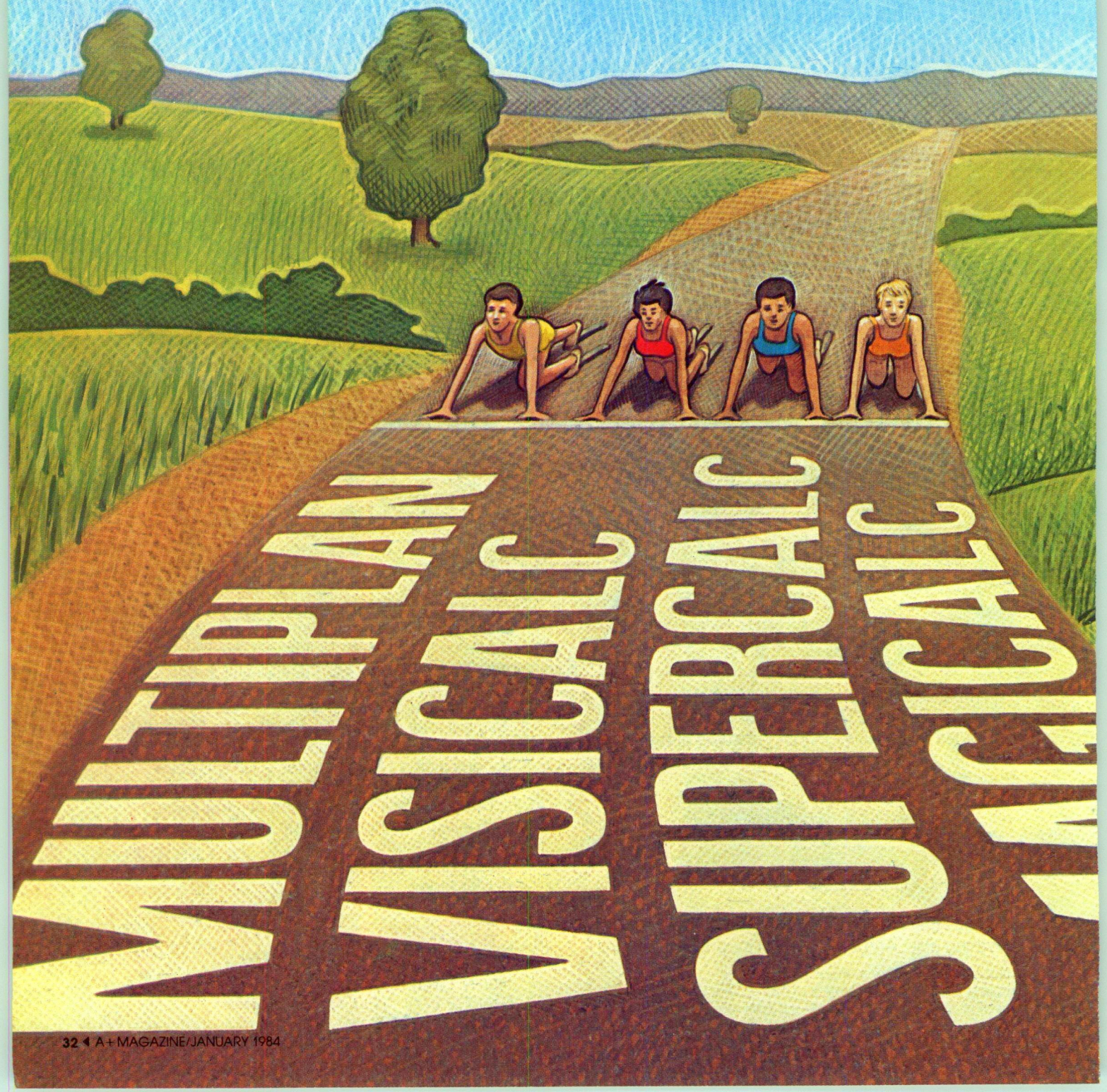
1400 N. Lakeview Ave., Anaheim, CA 92807 U.S.A.
(714) 779-2772 TELEX: 183511 CSMA
©Orange Micro, Inc., 1983

CIRCLE 130 ON READER SERVICE CARD

FINANCE/BY BARRY BAYER

ON YOUR MARK, GET SET, CALCULATE!

Four financial programs expand your calculating abilities.



The Apple II computer came to market in 1977. The machine, with 4K or perhaps 16K of RAM and a "fast" cassette off-line storage system, convinced thousands of computer hobbyists that this new competition to the Commodore Personal Electronic Transactor (PET) was capable of doing honest-to-goodness work. To computer professionals and to businessmen who felt they needed a computer but didn't want to spend tens of thousands of dollars on a minicomputer, however, the Apple II was but a toy. Since little software was available, these "experts" were more or less correct.

A year passed, and Apple Computer brought out the Disk II, complete with a disk-operating system with mimeographed instructions. Well, DOS 3.0 was quickly succeeded by DOS 3.1, and then 3.2—and the mimeographed instructions were replaced by the *Dos and Don'ts of DOS*. Steve Wozniak's Integer BASIC was replaced by the Applesoft version of Microsoft BASIC, complete with floating-point calculations and high-resolution graphics. More advanced games, a word processor or two, and even a couple of file-manager programs began to appear.

In 1979 Daniel Bricklin and Robert Frankston, who had been trying to stir up some interest in a computer program that converted the Apple II to a visible calculator, teamed up with Dan Fylstra. He was a Harvard Business School acquaintance of theirs who had been marketing a chess program and some educational software for the Apple under the name Personal Software, Inc. Subsequently, a $79 program called VisiCalc hit the market. VisiCalc gave the Apple computer

began shipping the long awaited VCAV

grams take advantage of the Hayes Micromodem II's auto-dial feature. For some odd reason, the Chase boot diskette is copy-protected, which makes life tough when it crashes; I had two such crashes, both forcing me back to the teller lines while I waited for replacements. Citibank's software reproduces very well with the good old Copy A command. Each bank also furnishes an additional diskette: Citibank's lets you configure the boot disk to your system; Chase's is for archiving the checkbook register, but more about that later.

With Chase Home Banking, once you have entered all your transactions, the main menu's Call Chase option dials the bank, logs on to the system, extracts your latest balances, and proceeds to perform a two-way transmission of data. Once it has sent all your entries to the bank's computer and received data, such as any mail or bulletins you might have had waiting, the program logs off. Your screen will now tell you if the diskette contains any new mail or bulletins, and a couple of keystrokes will gain you access to them. Citibank's HomeBase program, on the other hand, puts you in direct touch with a bank computer. After you make contact, you no longer need the diskette, and all your transactions are performed on-line.

Let's compare how the two systems handle a few important functions:

Obtaining Balances

Chase writes your balances to the diskette each time you access the system, but it can take many hours before the figures reflect your most recent transactions. Citibank gives you a truer balance, complete with interest accrued, where applicable. If you transfer money between accounts or pay a bill, the balance is immediately updated on Citibank's system, but not so on Chase's. Chase does, however, list the time and date reflected by the balances, but the delay makes little sense considering the technology involved.

Paying Bills

One of the most convenient features of home-computer banking is the ability to pay bills without having to write out a check and pray that the postal service will not lose it. Here, Citibank's approach is considerably better than Chase's. Both systems require that you enter a name, address, and account number for each payee in advance, and both make the payment with a bank check bearing your name and account number, but here is where the similarity ends. With Chase Home Banking, you have to make requests to add new creditors to

HOME BASE

BILL PAYMENT BUDGET REPORT

HOMEBASE
P.O. BOX 703
OLD CHELSEA STATION
NEW YORK, N.Y. 10113

CUSTOMER IDENTIFICATION NUMBER:
62183355775374

STATEMENT PERIOD FROM
01-01-83 TO 08-31-83

MR. CHRISTIERN ALBERTSON
444 CENTRAL PARK WEST APT. 16C
NEW YORK, NY 10025

PAGE 1

MERCHANT NAME	STATUS	ACCOUNT NUMBER	TOTAL PAID YTD
ROXANN MANAGEMENT	ACTIVE	3- 60 42924-060183	1,287.72
NEW YORK TELEPHONE	ACTIVE	212 662 6046 132 3G	236.42
ITT U.S. TRANSMISSION SYSTEMS, INC.	ACTIVE	Z11510935	64.39
COMPUSERVE INFORMATION SYSTEM	ACTIVE	086-528-229	50.32
CON EDISON	ACTIVE	471029149500042	419.41
GROUP W CABLE	ACTIVE	20935-065625-02-0	129.75
WILLOUGHBY-PEERLESS BUS.MACHINE INC	ACTIVE	01195	93.14
CHGE CARD COMM CORP - MHT MASTERCRD	DELETED	5217 0011 0790 3508	154.00
CREATIVE COMPUTING	ACTIVE	40019978	19.97
BOOT-UP, INC.	ACTIVE	357	40.58
MHTCO -- MASTERCARD	ACTIVE	5217001107903508	50.00
		TOTAL	2,545.70

CITIBANK

HOME BASE

BILL PAYMENT STATEMENT

HOMEBASE
P.O. BOX 703
OLD CHELSEA STATION
NEW YORK, N.Y. 10113

CUSTOMER IDENTIFICATION NUMBER:
62183355775374

STATEMENT PERIOD FROM
08-01-83 TO 08-31-83

MR. CHRISTIERN ALBERTSON
444 CENTRAL PARK WEST APT. 16C
NEW YORK, NY 10025

PAGE 1

PAYMENT DATE	PAYMENT REFERENCE	PAYEE	SOURCE ACCOUNT	PAYMENT AMOUNT
08/01/83	000026	MHTCO -- MASTERCARD 5217001107903508	CHECKING - BAL. 0057227812	50.00
08/10/83	000027	ITT U.S. TRANSMISSION SYSTEMS, INC. Z11510935	CHECKING - BAL. 0057227812	5.76
08/10/83	000028	COMPUSERVE INFORMATION SYSTEM 086-528-229	CHECKING - BAL. 0057227812	10.39
08/17/83	000031	NEW YORK TELEPHONE 212 662 6046 132 3G	CHECKING - BAL. 0057227812	62.22
08/17/83	000029	CON EDISON 471029149500042	CHECKING - BAL. 0057227812	125.52
08/17/83	000030	GROUP W CABLE 20935-065625-02-0	CHECKING - BAL. 0057227812	43.25
08/19/83	000032	ROXANN MANAGEMENT 3- 60 42924-060183	CHECKING - BAL. 0057227812	416.28
08/19/83	000033	ROXANN MANAGEMENT 3- 60 42924-060183	CHECKING - BAL. 0057227812	12.96
			TOTAL	726.38

Samples show two of the statement options available with HomeBase.

CITIBANK

your list of payees via the system's mail option, and about three weeks must pass before you can make any payment. Citibank allows you to enter a new payee and payment simultaneously and cuts the waiting period down to a maximum of ten days. The Chase system is obviously designed for payments to business accounts, utilities, bank loans, and the like, but Citibank seems more flexible, as my test of the system bore out: I added a friend as a payee, giving his bank's address, his checking-account number, and an amount to be paid—his account was appropriately enriched within ten days. Citibank also allows you to enter regular monthly, quarterly, or yearly payments in advance, and you can even stipulate an amount beyond which no more payments are to be made. Chase lets you enter payments up to a year in advance, but you have to enter each payment separately. Since you don't get any cancelled checks, you must rely on the bank's monthly statement for proof of payment. Citibank goes a step further by mailing its customers a monthly "Bill Payment Statement and Budget Report" listing all payments made, the year-to-date total for each account, and the grand totals for both month and year.

Deposits and Withdrawals

Versatile as your Apple is, you can neither deposit cash into it nor retrieve cash from it (alas), but Citibank allows you to order presigned Citicorp travelers checks through the system, in the amount of $300 or more. A laser forges your signature on these checks, and you receive them in the mail a couple of days later. You can also mail in a deposit (using prepaid envelopes the bank supplies), recording the fact that you have done so. Mail service being what it is these days, Citibank will acknowledge receipt of your deposit or, if five days pass without receipt, give you the bad news. Chase has no such services. Citibank also makes it easy to find out if a check has been cleared, in that you can do a search of your statement by check number, amount, or date.

Home-banking customers receive monthly statements, just as everyone else does, but having your bank reach your Apple (or vice versa) gives you more immediate access to the bank's register of your transactions. Here, again, Citibank has the better system—it lets you retrieve all transactions for the past 60 days at any time. Chase gives you only the transactions made since you last logged on to the system, and if you don't have a printer set up to generate hard copy, that information disappears forever from your screen once you move on to other parts of the menu.

Chase is also somewhat stingy when it comes to giving you information on current interest rates, CDs, IRAs, and so on. You request the information electronically and receive it by mail, usually in the form of brochures that, quite naturally, cannot keep you up with fast-changing rates. Citibank gives you all the current Citibank rates plus trend and forecasts, all on-line and up to date.

So, you ask, "Whatever happened to 'the Chase advantage'?" The answer is that Chase Home Banking does do some things better. One very important area in which Chase has the upper hand is customer service. Both systems make it easy for you to contact a real person by either phone or electronic mail, but when you call Citibank, an anonymous person answers, and a beep tells you that your conversation is being recorded (presumably for the same people who were hiding behind the mirrors). My Epson spits out graphics characters whenever I press Control-P while linked to Citibank. "What am I doing wrong?" I asked a voice at customer service. "I don't know," came the reply; "*our* Epson works fine." A big help that was—I still can't get a printout from HomeBase unless I use my NEC Spinwriter, which is connected to my Apple III. Chase actually gives you your very own personal banker, Mr. Wiegert, who seems to be familiar with every customer and goes out of his way to assist. Even now, months after I closed my Chase account, Mr. Wiegert not only knew who I was (when I called him in connection with this article), but he still had my account data in his computer! That might bother some people, but, living in the big city, I found it quaintly small-townish. Of course, as Home Banking grows and goes public, it will inevitably extend beyond Mr. Wiegert's reach, but the personal touch is there now, and it is lacking at Citibank.

EACH TIME A RESEARCHER CALLS YOU AND YOU ANSWER A QUESTIONNAIRE, THE FEE IS MAGICALLY WAIVED.

The Chase system has a few other advantages. The software, for instance, includes a checkbook register that is better than any Apple checkbook program I have seen. It prompts you step by step, automatically puts entries in chronological order, and allows you to code each entry and reconcile checks. The register has a capacity of 251 checks, but archive diskettes are easy to create, so there is no real limit. You can also merge and otherwise manipulate them with the help of an expansion diskette the bank furnishes. Unfortunately, the bank's computer does not automatically enter checks into your register—that would have been the sensible way to do it—but the register is still a good feature, and built-in utilities that let you generate checkbook-register reports in a variety of configurations make it even better. Citibank offers no equivalent feature.

So what does all this cost? Chase, which you can access around the clock, charges no fee as yet—beyond the usual monthly checking-account fee of $6—but you can be sure they are working on it. Citibank's system is open for business from 8 A.M. to midnight and has a monthly charge of $10, but each time a researcher calls you and you answer a questionnaire, the fee is magically waived. Ten dollars is actually a bargain, especially when you consider that Citibank throws in three Dow Jones News/Retrieval services: News (for the past 90 days), Current Quotes, and Historical Quotes.

Finally, we have the question of privacy and possible electronic intrusion. With an ever-growing army of whiz kids (young and old) poking and peeking to see how far their modems will reach, there is always the chance of someone getting closer to your bank account than you would want, but I have not heard of any illegal access in connection with home banking. Chase software requires that you enter a password before it will run; Citibank wants both the number of your Citicard and your personal identification code. To the determined hacker, these are probably mere obstacles, but your money is no less vulnerable if you bank the old-fashioned way.

To sum up my experiences with the two systems, Citibank's HomeBase is clearly my favorite, but both series represent a giant step away from the teller's line—and that, no matter how you slice it, is a giant step in the right direction. Now, if they would just offer an 80-column option and stop using pony express to get my checks cleared. ✚

FINANCE·FO
ARTEL
JCPenney
apple ///

▶FINANCE/BY JAN SHAW

APPLE KEEPS TRACK OF SOUNDTRAX

Small recording studio swears by variety of business-software applications

Horodko Soundtrax is a tiny company with a reach out of proportion to its size. Hundreds of thousands of people throughout California have unknowingly heard what Horodko Soundtrax does in radio and television commercials produced, all or in part, by the five-person company in its recording studio in San Francisco.

All of the financial work and business planning of this going enterprise with an expanding list of advertising clients is done on an Apple III.

Sitting at the III in his home office in nearby Alameda is owner and president Ed Horodko, the 38-year-old former classical-radio disk jockey and engineer who began Soundtrax four years ago. He bought an Apple II for the business three years ago, he says, because he is interested in electronics anyway and wanted to run the office quickly, efficiently, and inexpensively. He switched to an Apple III two years ago.

Horodko explains that he still does a lot of announcing for his recording-studio clients, but at the moment, he seems to be enjoying demonstrating how he does "everything" for the business on the Apple III.

"Everything" includes accounts receivable, including printed invoices; accounts payable, including payroll, financial planning, and forecasting; word processing, including scripts, rate cards, brochures, a handbook, and correspondence; and general business planning, including a "thought-processing" program.

Since he purchased the Apple III with 256K memory, a Monitor III, and an external floppy-disk drive two years ago, Horodko has added more equipment,

He seems to be enjoying demonstrating how he does 'everything' for the business on the Apple III.

piece by piece. It includes a NEC 7710 printer, an Apple ProFile hard-disk drive with a 5-megabyte capacity, a Hayes Smartmodem (a device to send and receive data over telephone lines), a MicroSci drive (a .5-megabyte floppy-disk drive that

uses floppy disks that hold four times as much information as a regular floppy disk does), and a Radio Shack Model 100 lap computer.

The Apple III has room for four cards, but Horodko uses only two. One allows the computer to use the ProFile hard disk, and the other is a game-port card that provides the same game-port function as that of an Apple II.

What appears to fascinate Horodko most are the programs. Horodko relies primarily on five off-the-shelf programs—he describes them as "the best"—and a handful of utility programs for his business.

"My Apple III is running under a system called Catalyst II," he says. "What Catalyst lets you do is take almost all your programs and actually put them on the hard disk. The advantage of having all your

Horodko relies primarily on five off-the-shelf programs and a handful of utility programs for his business.

programs, as well as the information files that the programs generate, on the hard disk is that you don't have to fiddle around with your floppy disks."

Without Catalyst, Horodko says, he would have the time-consuming task of finding the correct disk, inserting it, using it, saving the data, putting it away, finding the next one (hoping he'd filed it in the right place), and starting again. The point of using a computer, he says, is to get things done quickly.

"With Catalyst, you just push a couple of keys, and there you are in the other program."

Horodko continues, "This is the main menu. When you turn the computer on with the Catalyst program in the drive, it gives you this menu, which is all my programs."

As he runs the III through its paces, he explains that when he first decided to computerize the business, he didn't know *anything* about computers.

"Of course, at the time, there were only about four comparably priced personal computers on the market," he says. He shopped, asked questions, and ended up choosing his original Apple II, which he still uses to address and print labels in the studio, for two reasons: "A lot of programs were available for the Apple, more than for any other company, and the monitor wasn't built in to the computer."

He had the idea that announcers could use the monitor instead of paper for their scripts. The idea did not take the industry by storm. The industry, in fact, was highly resistant to the idea, he says. It never got off the ground.

Horodko punches in Versaform, a number-crunching database program that he uses for invoicing—among other things—from figuring out the bills to printing them.

To demonstrate, he types in his code for the Ketchum advertising agency in San Francisco. Up comes the address. He adds a purchase-order number and a job number and then fills out the rest of the form by adding the stop and start times of a recording session and the type of session—in this case an eight-track-tape session. (Some recording sessions are more complex than others, which is reflected in the hourly rates.) After entering three pieces of information—start, stop, and type of session—he leans back in his chair and pushes the Enter button.

Onto the monitor comes the number of hours in and the rate of an eight-track recording session ($70). The computer multiplies the hours by the rate, producing the price. At the bottom of the screen is a running total of everything on the page. The program automatically adds sales tax and computes the total.

Then Horodko keys in the price of a different kind of recording service, the cost of a tape in this case, and again sits back as the computer instantly enters it on the invoice, adds it to the total, re-computes the sales tax, and gives him a new grand total. As the Ketchum sessions continue over the course of a month, these few steps keep the Ketchum account current. As Horodko says, the point of a computer is to get things done quickly.

If he pushed a few more keys, the Ketchum invoices or all the rest of the invoices for the month would print out "perfectly," Horodko says.

For accounts payable, Horodko punches up Advanced VisiCalc, a program that acts as a giant spreadsheet. On it he keeps

The point of a computer is to get things done quickly.

track—individually and by category—of checks, expenses, bills, and payroll. He says, smiling, that VisiCalc "will do virtually anything with numbers."

Horodko uses a graphics program, Graph 'n' Calc III, to project trends through graphs and charts. His word-processing program is called Word Juggler.

His favorite program is ThinkTank. He uses it in general business planning and describes it as a cross between a database and a thought processor that "forces you to think logically."

He greatly admires the programs he uses—a contrast to his early experi-

ences. Horodko says that at first he spent over a $1000 on "really horrible" programs.

"I bought a lot of the programs because a salesman told me what I needed. It would invariably turn out wrong. Finally I joined a couple of users' groups and talked to a lot of Apple users, and after a while I learned to spot a good program."

Horodko praises the users' group Apple III SIG (Special Interest Group) on The Source. It has what amounts to a big community bulletin board where people hash out computer problems, note good and bad programs, keep up on news, and help each other out, he explains.

Advantages of the III, according to Horodko, include the "fairly big file capacity" in the hard disk—five megabytes. "That's equivalent to about 38 5¼-inch floppy disks," he says. "It's not gigantic, but it's big. You can buy them bigger, but this is enough for me."

Another advantage of the III, he says, is that it has the ability to "emulate the Apple II" with the insertion of an Apple II emulation disk.

When asked about the limitations of the III, Horodko pauses for quite a while. "There aren't any, really, for my needs," he says. Another pause. "Well, maybe there is one. It's not a limitation for me because I don't need it, but I haven't yet seen a database program that's completely compatible with the Catalyst system and that lets me freely move information in and out of itself."

Good database programs are available, he says, but data has to be keyed in rather than shifted automatically for other programs. That could be a serious problem for someone with needs different from his own, he says.

Horodko leans back, having run the Apple III through all its paces, then turns off the computer. The demonstration is over, and it's back to business. The Apple III may print its invoices in "perfect" batches in no time at all, but Horodko still has to staple them together and glue on the stamps just as he did before computers. ✚

▸**FINANCE/BY VANESSA SCHNATMEIER**

BUDGETING A LA APPLE

From cables to labels, firms use micros to forecast the future.

Medium-size companies that use microcomputers for financial planning, market forecasting, and day-to-day management have their own special needs. Although every company has a unique plan for its micros, the following portraits show how two companies use Apple computers to fill the bill.

ARTEC

The Arlington TeleCommunications Corporation (ARTEC) provides cable television to more than 20,000 subscribers in Arlington County, Virginia, just outside of Washington, D.C. In 1980, ARTEC's chief operating officer, John Evans, decreed that Apple computers would help predict the company's financial future.

ARTEC started out with "one small Apple" with a single external disk drive and an IDS 560 Paper Tiger printer, but Michael Sullivan, director of customer services, says Evans quickly realized what kind of tool he had found and soon expanded the company's stable of computing equipment.

ARTEC now owns two Apple IIIs with a ProFile hard disk, and two IBM PCs; in addition, the firm is about to purchase a Compaq computer. Eventually ARTEC might buy a Corvus hard disk with an Omninet Diskserver, with the aim of networking the Apples, the IBMs, and the Compaq so they can share mass storage.

ARTEC uses the Apple IIIs for all its budgeting.

Sullivan says ARTEC uses the Apple IIIs for all its budgeting, employing the VisiCalc and Advanced VisiCalc spreadsheet programs, which he calls "tremendous programs."

"With an industry as new as the cable business, it's extremely helpful to be able to play the 'what if' game. If you attempted to do it manually, it would be extremely time-consuming and paper-generating," he says. Sullivan praises the spreadsheet programs for their ability to let ARTEC know where it stands financially at any moment.

ARTEC's financial numbers have to jump through an ever-increasing number of hoops, and the franchise's financial managers use the Apple IIIs to perform all capital budgeting

and forecasting. ARTEC segments its overall budgets into departmental budgets and projects the needs of the departments with the Apples. It also produces its balance sheets on them, but the Apples don't construct the company's final corporate statement; a general-ledger service takes care of that job.

Operating statements and performance analyses—revenue per subscriber, subscriber penetration levels, cash flow to revenue, debt per subscriber, cash flow per subscriber, revenue per mile of cable, cash flow per mile, and investment and marketing costs per subscriber—are all on computer now, according to Sullivan. "Nothing is done manually any more," he explains.

ARTEC uses a variety of software besides the ubiquitous VisiCalc to massage its numbers: VisiSchedule, VisiTrend + VisiPlot, Apple Writer III, PFS: File, PFS: Report, and Apple Business Graphics. Fifty percent of the firm's computer use involves VisiCalc, though, says Sullivan.

'Ideally, we would like to use the personal computer for our service history, our billing, and our trouble-call scheduling.'

VisiCalc comes in particularly handy for estimating subscriber penetration levels and construction costs, according to Sullivan. "We do our projections using the Apple by looking at what the current penetration is and what we expect it should be, based on what the government tells us is there. We can detect areas that appear to be low; we can also look at areas that appear to be higher than what we had projected initially. Then, of course, the human interpretation comes in."

ARTEC went with the Apple III because it came standard with 128K RAM, whereas the Apple II held only 48K at the time. The company generates large spreadsheets that require that extra memory, Sullivan points out. Every in-house computer at ARTEC has a minimum of 256K, and some have more, because the firm wants to analyze as much data as it can.

That doesn't mean everybody at ARTEC spends hours a day hunched in front of a terminal. Of the company's 65 employees, 14 work with the micros during an average month. ARTEC houses its computers in a data-processing center, with sign-up schedules for casual users.

"Ideally, we would like to use the personal computer for our service history, our billing, and our trouble-call scheduling, but no single kind of personal computer can handle that kind of task," comments Sullivan.

"If there were some way we could combine our billing functions so that a personal computer could take care of them, it would be a realistic concept [to have a computer on every desk], but now we primarily use the computers as a management tool instead of as a day-to-day information network."

Sullivan is not completely happy with the Apples, although he is fully aware of the benefits they have brought. For one thing, because so little software is available for the Apple III, the financial analysts often have to work with programs in the Apple II Emulation mode. It's no problem, really, if they are running a file that doesn't use up much memory. With larger files, the analysts are restricted to the Apple II's 48K, though.

They have arrived at a solution. Says Sullivan, "The key is that you pinpoint a few items, perhaps a bottom line or a bottom line in a series of 12 or 13 months with an average and a year-to-date total. That amount of information would not prohibit you from using the Apple II to do your printing and plotting."

Sullivan also believes that the Apple disks contain too little storage capacity. He points out that whereas Apple disks can store only 133K on one disk, IBM and Commodore disks can store 320K. On the other hand, Apple disks are easier to use and take less time to format, he noted.

ARTEC isn't planning to purchase any more personal computers; if anything, the company wants to introduce the computers it already owns to each other. In cooperation with a local dealership, Universal Computers in Alexandria, ARTEC has set up communications between the IBM PC and the Apple III, arranging a kind of forced marriage between Apple Access III and IBM PC Talk.

For firms contemplating the purchase of personal computers for financial analysis, or indeed for any part of their business, Sullivan emphasized the importance of a dealership's support.

"You can go into any one of 20 to 25 stores and get the same product. What makes one better than the other? Most people starting out with personal computers have a lot of questions that they don't even know they have to ask, and it's so important to have a dealership that is really attuned to your needs."

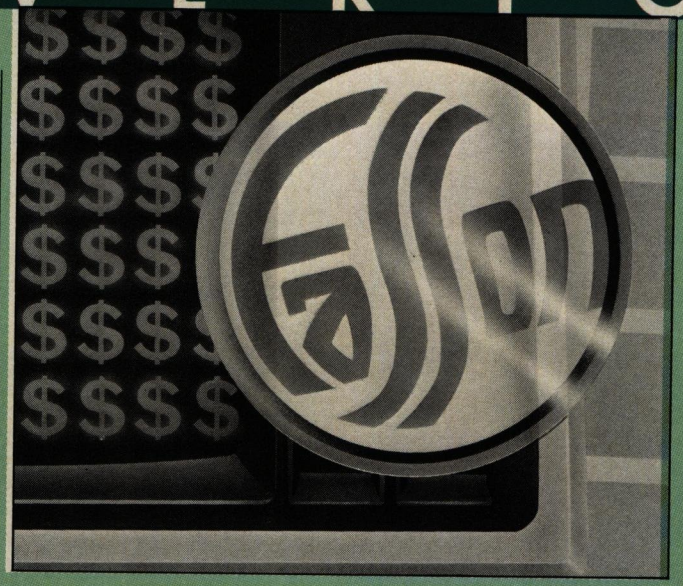
Fasson Industrial

"Green-eyeshade people were always pictured as people sitting in front of large pieces of paper, adding columns and cross-checking them and putting little tick marks down when they added properly."

ARTEC isn't planning to purchase any more personal computers; if anything, the company wants to introduce the computers it already owns to each other.

That's the word picture of precomputer financial analysts painted by Hugh Kent, until recently the controller of the Fasson Industrial division of Avery International, the world's largest label-making and -printing company. Fasson Industrial, based in Painesville, Ohio, employs approximately 300 people and contributes a substantial (though unspecified) portion of the $450 million revenue of Avery International's Materials Unit.

Kent currently serves as



the management systems manager for Avery International's entire Materials Group, of which Fasson Industrial is one division. But in June 1980, as controller at Fasson, he oversaw the introduction of personal computers—Apples II Plus, IIe, and III, in particular—into Fasson's increasingly Byzantine financial-planning operation.

"We bought Apples because we saw VisiCalc. We would have purchased any machine in the world that happened to run VisiCalc, if we could have afforded it," Kent says.

Financial analysts and planners were the first microcomputer users at Fasson, and those ex-green-eyeshaders were impressed by the way the Apples transformed once-tedious tasks into a few minutes' work.

Before the Apples, Kent says, "the simplest of what we now think of as spreadsheets used to take hours and hours, and doing 'what ifs' with those same spreadsheets sometimes took days."

At first, Fasson bought two Apple II Pluses, but in short order it became clear that the company would want more. Today, as at ARTEC, five Apples of various models are in "walkup configuration," set up at central locations.

The machines permitted Fasson to create assumption-driven profit-and-loss statements (P&Ls), a long-desired dream for the division's analysts. An assumption-driven P&L differs from the usual type in that it consists of product statements built up product line by product line, rather than department by department. In one stroke this approach minimizes interdepartmental rivalry and clarifies the financial strengths and weaknesses of a group of products.

For instance, Kent explains, analysts "divided the factor called unit-volume increase into subcategories such as industry growth rate and industry-share-penetration change. By the time we were finished, we had a complete picture of the factors affecting any one product. Then we added the product lines together and ended up with a better understanding of the whole business." The entire process took about two months less than Fasson's previous financial-planning efforts ever had.

'We would have purchased any machine in the world that happened to run VisiCalc, if we could have afforded it.'

Financial planners find it useful to allocate indirect or fixed costs to individual product lines. Say an analyst wants to figure out the marketing costs for product lines A and B. If A is 60% of the sales for the group and B is 40%, the simplest method is to multiply the cost of marketing by 60% for product line A.

"Prior to VisiCalc, we knew how to do it, but with the mechanics involved, there were so many numbers going in so many different directions that we couldn't do it on a timely basis. By the time we'd finished it, management probably wouldn't have cared, and we would have been into a subsequent accounting period."

Now assigning allocation factors is simple. "If you take all your indirect costs and assign them to one of your product lines—if you can assign every cost to one or more of the product lines—then you can compute an income statement all the way down from sales to net income after taxes," says Kent.

Computers in general and microcomputers in particular have eased the minds of planners at many corporations, Kent believes. The economic upheavals of the 1970s and the near-depression of the early 1980s focused the attention of many corporations, large and small, on balance sheets and cash flow. Though many companies predict income well, predicting balance sheets is far more difficult. Number-crunching micros cater to the financial planner's nervous need for current and complete figures.

Thanks to the Apples, Fasson Industrial's planners created fresh product-line income statements every month and eventually worked into weekly income forecasts.

"Once we set up the formulas in a VisiCalc model [the largest spreadsheet available on an Apple III], they were very easy to generate every month. We would generate product-line income statements all the way down to the net-income line, within a few hours after we closed the books."

Armed with this information, Fasson's management felt more secure in making investment decisions.

Most financial planning is aimed at ascertaining what happened last week or last month, says Kent. With the microcomputers he has attempted to drive the detail of the forecasts down through the organization and coax other employees to think ahead rather than behind.

Although he's now creating in-house software to run on IBM equipment—Avery International has decided to go with the IBM PC—Kent believes that the initial purchase of the Apples pushed Fasson Industrial's financial planning into the computer age at last.

"The Apples' biggest benefit to us was that they got us started and that they were the only machines that ran VisiCalc. That created a revolution in the office workplace and allowed lots of common people like me, at various levels of accounting and financial planning, to get started on computing."

▸FINANCE/BY LAWRENCE GREENBERG

J.C. PENNEY'S CRYSTAL BALL

How a large corporation, J.C. Penney, uses a little computer, Apple, to plan the next half-century.

At J.C. Penney's Milwaukee distribution center, Ron Burr is cheerful—and he's been cheerful for over two years. As technical manager in the company's catalogue division, he was instrumental in establishing the Catalogue Budget Planning System in June 1981. This Apple-based network reaches from the company headquarters in New York City out to its six nationwide distribution centers. Why is he so cheerful?

To answer that question, Burr first describes how the budget-planning process takes its course at J.C. Penney. Annual raw sales data in the New York office are broken down by distribution center, showing weekly sales figures, and transmitted out to the six locations. The centers then build the balance of their budget plans for the coming year and send a copy of the final plan back to New York. There, financial managers consolidate the data to produce a divisional budget that is the basis for six-month, year-long, and five-year market forecasts.

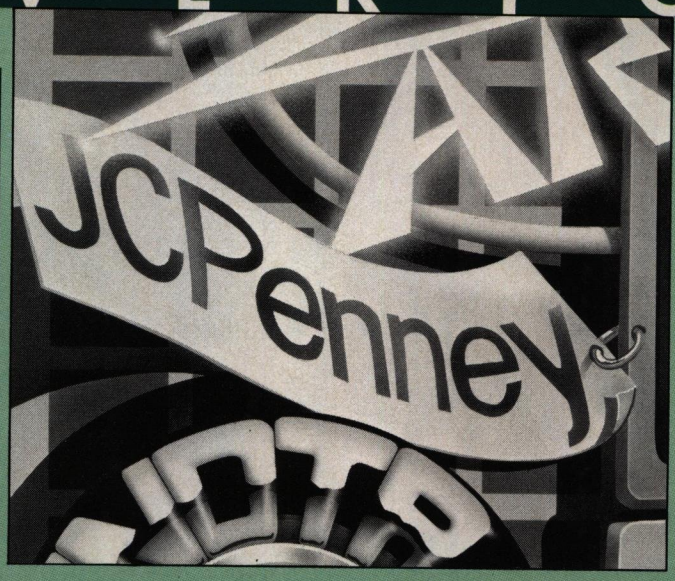
Burr goes on to explain that Milwaukee is really a second data center for the network. The other five centers transmit mark-down (liquidation) data to Milwaukee to be consolidated. The consolidated data go back to New York in the form of a divisional report and back to the distribution centers as a series of comparison reports. "Prior to June of '81," Burr says, "the whole budget-calculation process was only semi-automated, with just a few mainframe programs available. Mostly it was a manual operation and took a lot of time. Also, we had to use telecopier processing to receive and send out sales data to the distribution centers. Managers almost always had to wait until about 11 A.M. the day after the transmission before receiving anything."

Things changed radically when J.C. Penney bought a series of Apple II Plus computers. Every distribution center began with one; now each location has two II Plus computers and one IIe. I asked Burr why the firm had chosen the Apple. "At the time, it was the number 1 personal computer on the market, with the greatest range of software availability. We knew we were going to get a personal-computer system—for reliability, speed, and flexibility. It was primarily the software that did it." Does IBM's recent edging Apple out of first place in the microcomputer market affect the company's satisfaction with its decision? "Not at all," he said. "We're happy with what we have. I don't see any substantial hardware changes for quite a while."

Flexibility is especially crucial; as any financial-operations manager knows, budgeting is always subject to change.

To explain the basis for the company's choice further, Burr says, "All six centers and New York are now interconnected by MicroCourier [a software package that handles network transmissions]. This means we can get information much faster from New York and also send it out faster. We used to have to wait until the next day to get anything; now it's only a matter of hours." Because calculation turnaround time is much faster, "we're in a better position to explain analyses and forecasts." Burr notes that the entire budgeting process since the installation of the Apple network is more reliable and flexible. Flexibility is especially crucial; as any financial-operations manager knows, budgeting is always subject to change. "The Apple handles year-to-year changes much faster. We really speeded up the whole process of producing the budget," Burr said.

The Milwaukee distribution center was the site responsible for the initial development of all system design and in-house software. It currently manages all new program development and existing-software modification and retains backups of both data and software for the New York office. To accomplish these functions, Milwaukee uses a Corvus 20-megabyte Winchester mass-storage system. New York has an identical unit to provide data storage for its three II Plus computers.



In New York, Al Sieczkowski, the catalogue budget analysis and reporting manager, coordinates the flow of financial information for the entire network. He talked about his perspective on the Apple network at company headquarters: "Although 95% of our programs here in New York are on disk, the 5% that are on the Corvus are extremely large number-crunching programs and could in no way be handled by disk storage. Our programs were infants in the beginning; as we grew and learned more, we got into the more sophisticated programs for which we needed the Corvus."

Not long ago, Sieczkowski's office bought Apple IIIs; an interesting development followed. "We were using the III for market forecasting soon after we got it, but because we had used the II longer and were more familiar with it, and because we felt there would be difficulty in transferring software from the II to the III, we now have all market forecasting on one of our II Plus units." The other two II Plus machines are used for financial reporting.

As the hardware for budget planning, market forecasting, and related applications has changed, so has the software. The consolidation of sales data in New York is now managed with MergeCalc software, for which Burr has only good words. The company's catalogue division has developed in-house software for the weekly sales-data distribution-center breakdown. And the six distribution centers use VisiCalc to project the following year's sales demand from the weekly data.

Although neither Burr nor Sieczkowski sees any real problems with the current network system, both are enthusiastic about planned enhancements. Primary among these is the downloading of all required software from Milwaukee's IBM 3081 mainframe to the Apples, both in New York and in the field. Al Sieczkowski explains, "We're still in the process of refining our Financial Information System—our mainframe financial database. We had to delay the downloading project to work on FIS, but at this point, it looks like downloading should be in place within a year or so."

'It will be really interesting to see people who are so much more comfortable with personal computers become managers.'

What are the advantages? Foremost is the availability of up-to-the-minute information. Although current information access is much faster than in pre-Apple days, the age of the information must sometimes be estimated. Storage in the mainframe database would insure the accuracy of all data. Additionally, the availability of all information from a central source means that inputting errors from multiple locations are eliminated and that the same figures don't have to be entered repeatedly for a given report.

J.C. Penney is now in the midst of a study to investigate the use of additional personal computers for its financial operations, including such applications as operating statistics and expanded reporting capability. Ron Burr foresees a time, not too far away, when selected company employees will be working at home with their Apples and when every manager will have one on his desk. "They're too cheap not to be!"

Hardware is not the only reason for this vision of proliferating Apples. "The software is so much better now," he continues. "I think users are feeling much more comfortable because today's software is multifunctional. You don't have to keep changing disks to do a number of different tasks. You load up one disk, and you can do quite a bit with it now."

Burr is also looking forward to seeing what he terms "whiz kids" moving into managerial spots. "It will be really interesting to see people who are so much more comfortable with personal computers become managers. I think they'll take advantage of them much more readily than managers are doing today. They'll really see them as handy tools for all kinds of purposes." The Milwaukee center has a summer internship program to help high-school students become familiar with the Apple. In fact, one student has his own Apple at home and regularly communicates with the catalogue division throughout the year. Burr wants to expand this training program as much as possible.

Does J.C. Penney have any suggestions for setting up a network system like theirs? Ron Burr says, "Start with a good overall design to insure that you produce the results you want. Keep in focus what a personal computer can and cannot do—don't get overconfident. A specific limitation is the speed of printing out reports. Use as many software products as possible to minimize in-house programming. And I'd strongly recommend using MergeCalc for data consolidation, as well as the Corvus for large data-storage requirements."

The foundation of good corporate budget planning is efficient use of time. Ron Burr is cheerful because J.C. Penney's catalogue-budget planning and market forecasting are clearly more efficient than they were just a short two years ago. How important were the Apple computers? Burr looks up and smiles. "What would we do without them?" ✚

PLUMBING
INVOICE
CHECKBOOK

COMPUTERIZING YOUR CHECKBOOK

When you've gone from a single bank account to numerous ones, it's time to turn to your Apple for help.

When Al Coiner was just out of college, he would have laughed if someone had suggested he needed computerized help in balancing his checkbook: "You've got to be kidding. I've got one checkbook and one bank account. I don't even need a calculator!"

But then (the fictional) Al married Vikki Green (equally fictional), who also had one checkbook and one checking account. Over the next few years the Coiner-Greens acquired

- household expenses
- daughter Beth
- a house complete with mortgage and balky plumbing
- a two-flat apartment building, courtesy of Vikki's lamented great-aunt Charlotte, complete with tenants, depreciation, and deductible expenses, and
- an Apple IIe.

By mid-1983 they had a checking account with four separate checkbooks—Al's personal checkbook, Vikki's personal checkbook, a household checkbook, and one for the apartment building. In addition, Al, who worked on commission, had a money-market account that he used to gainfully employ large commissions and then draw on for monthly expenses.

"Help! We're drowning in paperwork," they cried.

Two or three years ago it seemed the woods (or at least the computer stores) were full of Apple software for balancing a checkbook. But to many people, it seemed like using a sledgehammer when a flyswatter would do, and most of these programs disappeared. Today, computerized checkbook balancing still exists, but with a difference. Today's programs are designed for multiple checkbooks or accounts and are as applicable to small businesses or partnerships as to household accounting.

One computer-store owner in San Diego says he offers two possibilities to customers looking for multiple-checkbook-balancing software—either The Home Accountant, a popular program from Continental Software, or one of the database "calc" programs (which require lengthy setup). Does he have any other specific checkbook programs for the Apple? Just one: a single-checkbook freebie that comes on a multiprogram disk he gives to people who buy Apples from him. How about the program, Personal Finance Manager, from Apple? It too handles only one checkbook, along with several credit cards and other items.

An unscientific spot check of other software dealers tells much the same story. There is a newcomer to the field, though, a program called Money Street from Computer Tax Service.

I acquired The Home Accountant and Money Street, both of which were new to me, for review. I applied them to the five-bank-account financial situation of Vikki and Al Coiner-Green. Both programs are designed for similar functions: recording checks, deposits, and other transactions; reconciling bank statements; sorting items by category and providing totals; and printing reports. My evaluation involved these questions:

- Does the program do what it says it will do?
- How easy is it to use?
- How easy is it to learn?
- How useful is the manual?

getful.

A minor problem was the refusal of Money Street to reconcile the December checks with a statement dated January 6. A moment's reflection and rereading of the manual led me to try the same thing with the statement dated December 31. This time it worked like a charm. It turns out that once a new year begins, you'll need new data disks, and only uncleared items are carried forward. I also had a one-time problem moving the cursor to the top of a check-register screen. After I switched to the category-code directory and then back to the screen, whatever the problem was disappeared and did not recur.

The most frustrating and time-consuming portion of the learning period involved getting the printer and Money Street in sync. The manual gives fair warning that you may have problems. Mine involved a "line feed" command. A section in the manual explains briefly about hexadecimal ASCII code, and the initial system configuration lets you enter various ASCII codes on the first line and the last line. Even though I configured the system to issue the correct line-feed command to the printer, nothing happened—everything overprinted on one line. At this point I decided to activate the line feed by throwing a DIP switch on the printer. This maneuver worked, and printing commenced satisfactorily.

I was also unable to successfully use the Money Street system configuration to issue the ASCII command for "correspondence-quality printing." Entering it in a BASIC program would have necessitated exiting from Money Street, issuing the command, and then reloading Money Street. Moral: try all this before you deal with actual data.

The manual provides the information you'll need, including a list of suggestions from customers and a series of customers' questions and answers. Between the screen information and the manual, you shouldn't have too much trouble becoming proficient in the use of Money Street. The manual's organization leaves a bit to be desired, though. The first pages include a glossary, a list of report options, and summaries of program limits (dollar amounts and number of uncleared items) and operations. But they also include "comments from happy customers" (page 14), and the manual doesn't actually tell you to boot the program disk until page 17. A tutorial that explains operations uses a list of sample data, but the instruction to enter it is on page 22, while the list itself is on page 6. Other information is in a readable question-and-answer format, but in no particular order, making it difficult to locate specific topics. For instance, the procedure for starting a new year is sandwiched between "printing a screen" and "finding cancelled checks." The section on "printing" follows this. Also, the wording in the manual doesn't always match what is on the screen, though the meanings are the same.

To sum up: Money Street does what it says it will do with checkbook information in an easy-to-use fashion, but it requires extra steps to consolidate data from various checkbooks or accounts. It is designed to make errors reversible and loss of data difficult. First-time users can have it in full operation within an hour, *if* they can make the printer connection. Though the manual warns of difficulties, the printer commands did not work for me. The manual contains the basic information you'll need, but it and the other printed material should have been thought out as carefully as the program itself obviously was.

The Home Accountant

The Home Accountant package is a 7 × 9-inch three-ring, hard-cover binder with the program disk in the inside front pocket and a warranty card (for

```
80N
                        CHECKBOOK
                     VIKKI NOV 1983
                  RECONCILE 1ST NATIONAL

                                                  $AMOUNTS
STATEMENT BALANCE                                 1068.91
OUTSTANDING CHECKS                                 75.47(-)
OUTSTANDING DEPOSITS                                0.00(+)
-------------------------------------------------------------
NET BALANCE                                        993.44
-------------------------------------------------------------
CHECKBOOK BALANCE                                 1050.88
-------------------------------------------------------------
YOUR CHECKBOOK:
DOES NOT RECONCILE BY                              -57.44
IN THE BANK'S FAVOR
                  (P)PRINT      (R)RETURN
                    ENTER SELECTION P

80N
```

Figure 4: A printout of a checkbook reconciliation

```
80N                    ADD BUDGET CATEGORIES
                           CATEGORY# 7
A TYPE 5 (1-5) EXPENSE
B         TITLE         VIKKI          WITHHOLDING          TAX
                                      BEG ACTUAL  DIFFERENCE
     BUDGET   C  2000.00
D JAN
E FEB
F MAR
G APR
H MAY
I JUN
J JUL
K AUG
L SEP
M OCT
N NOV
O DEC      500     0.00  500
TOTALS>  > 500 2000.00 1500-
                       LETTER TO EDIT (A-O)
X (CANCEL) P(PRINT) R(RECORD)
                    ENTER SELECTION P80N
```

Figure 5: Home Accountant allows you to print out almost every individual screen and transaction

extended warranty period, assistance, and updates); 136 loose-leaf pages of text, including a two-page index; and an order form for checks compatible with the system. It runs on the Apple II, II Plus, and IIe, with one or two disk drives (two are preferred). Some printed reports require an 80-column printer, but others need 132 columns. Each one-disk system can manage up to five checkbooks as well as other accounts, sort entries by category and print reports on them, reconcile bank statements, and print checks. It can also create three different colored graphs per budget category, though you cannot print these without a graphics program.

Starting to use The Home Accountant to manage checking accounts is not for the faint-of-heart, because the program requires lengthy preliminaries. I suffered two major setbacks before achieving any semblance of success:

1. The program disk was defective—a fact that was not immediately apparent.
2. Not until I'd completed the time-consuming task of setting up budget screens and mandatory cash accounts for each checkbook and budget categories to use with them—perhaps half an hour's work—did The Home Accountant inform me that it was impossible to start the year in December if it ended on December 31. Budgeting must start in the month prior to that in which checkbook items are to start. The program doesn't allow any additions, so my only alternative was to begin from scratch.

The first step in using The Home Accountant is to initialize a data disk with the Apple System Master DOS 3.3 disk. Once you do this, you boot the program disk for The Home Accountant. (Booting on an integer Apple with Applesoft on a ROM card must always begin with the System Master disk, followed by the program disk.) The configuration routine includes information on printer-card type (serial or parallel), and the manual even provides a list of ASCII commands for 11 different printer brands.

Budgeting involves naming and assigning starting balances to up to 100 items within five categories: Assets, Credit Cards, Liabilities, Income, and Expenses. For checkbook management, you need only two categories: Checkbook and Cash, both classified as assets. You prepare these on formatted screens, with the beginning amount and estimates for each month. I set up the Coiner-Greens' checkbooks beginning (the second time) in October, making it possible to start entering register items in November. Similarly, you have to enter each budget category completely, first deciding which budget type it is and then setting up monthly balances. The program assigns numbers to the categories.

Transactions is the menu for entering checkbook items. For each entry the categories are: Date, Transaction Number, Payee, Amount, Memo, Budget Category, Tax Deductible or Not, and Cleared or Not. You can handle transactions between checkbooks the same way. You can also split any entry, say a payment containing principal and interest. First record the entire amount and list Split under category. Then enter the same date, transaction number, and payee, but assign the appropriate amount to the desired category.

The program can perform searches throughout the checkbook by any field, date, or combination, and editing is also possible. Since you can't make new entries in a previous month, the manual suggests entering a few $0.00 dummy items each month, to allow for forgotten entries.

The Home Accountant's strength, its categories, is also its greatest deficiency.

Reconciling the checkbook involves entering check charges and other new items from the statement and then selecting Reconcile from the Transactions menu. Next, you enter the statement balance. Then, as The Home Accountant displays each transaction, enter Y for "yes" or N for "no" in the Cleared category. The program calculates the reconciliation, which you can print out. In case of a discrepancy (see figure 4), you can keep redoing the reconciliation until you achieve success.

The Home Accountant can print several reports of assets and liabilities, budgets, income, and expenses. Those related to the checkbook include a list of budget categories and their numbers, the month-by-month totals for each budget category, one month's checkbook balances, and checkbook activity for a given period. In addition, you can print out almost every individual screen and transaction, such as a check entry, before you save it on the data disk (figure 5). The program can also print checks, including the name and address of the recipient.

The manual is extremely thorough and guides you step-by-step through each routine. Numerous pictures of screens enable even beginners to succeed eventually.

The Home Accountant's strength, its categories (called modules), is also its greatest deficiency. The program is so structured and hierarchical that you have to adapt to it, rather than being able to tailor it to your particular needs. You must always complete the Budget module, with a form filled out with monthly estimates for each category, even if you simply want to keep running totals of a few of them in the checkbook. For all practical purposes, the cash account for each checkbook is busywork, even if you're interested in a total household budget. You can put five checking accounts on each data disk, but they are as segregated as if each were on a separate disk.

On the other hand, for a household or small business, the complete documentation not only provides all the information a CPA could want but, by its very structure, can also help the program's users gain more control over their finances. And if those users persevere through the lengthy preliminaries, transaction entering and checkbook reconciliation are speedy processes.

Motivated users will find that The Home Accountant performs adequately for checkbook management, but its overly rigid design makes the program difficult to adapt to less than total budget management. The thorough manual is the life-support system during the lengthy setup process. ✚

PRODUCT INFORMATION

Money Street
By Donald A. Hill, Jr., and Robert A. Payne
Computer Tax Service
Box 7915
Incline Village, NV 89450
(702) 832-1001
List Price: $99.95
Backup disk (max. of 2): $10
Utility disk: $25

The Home Accountant
By Robert Schoenburg, Stephen Pollack, and Larry Grodin
Continental Software Company
11223 South Hindry Ave.
Los Angeles, CA 90045
(213) 410-3977
List Price: $74.95
Backup disk: free during warranty period

In Apple Computer's LisaCalc spreadsheet program, high-resolution graphics, mouse technology, and internal memory of one megabyte team up to produce an intriguing product.

Not that LisaCalc's features and performance as a spreadsheet per se separate it dramatically from the competition (e.g., VisiCalc, SuperCalc, Microplan). The nature of the Lisa itself distinguishes this software product from the others.

For example, LisaCalc eliminates the need to learn a special modeling and editing command language, because it replaces the usual confusing computer commands with simple graphic images.

As with the other six software packages available for Lisa (LisaWrite, LisaGraph, LisaProject, LisaTerm, LisaList, and LisaDraw), high-resolution graphics, ease of learning and use, and ability to port data to other programs have been given priority.

Any review of a Lisa or "Lisa-like" program presents a problem. The Lisa operating system is so unlike CP/M or Apple DOS that most readers need a bit of orientation.

The Lisa's designers were thoughtful enough to create an operating environment that is visual in nature, making it exceptionally easy to master. For example, copying files is just a matter of moving an object around on the screen and pushing a button.

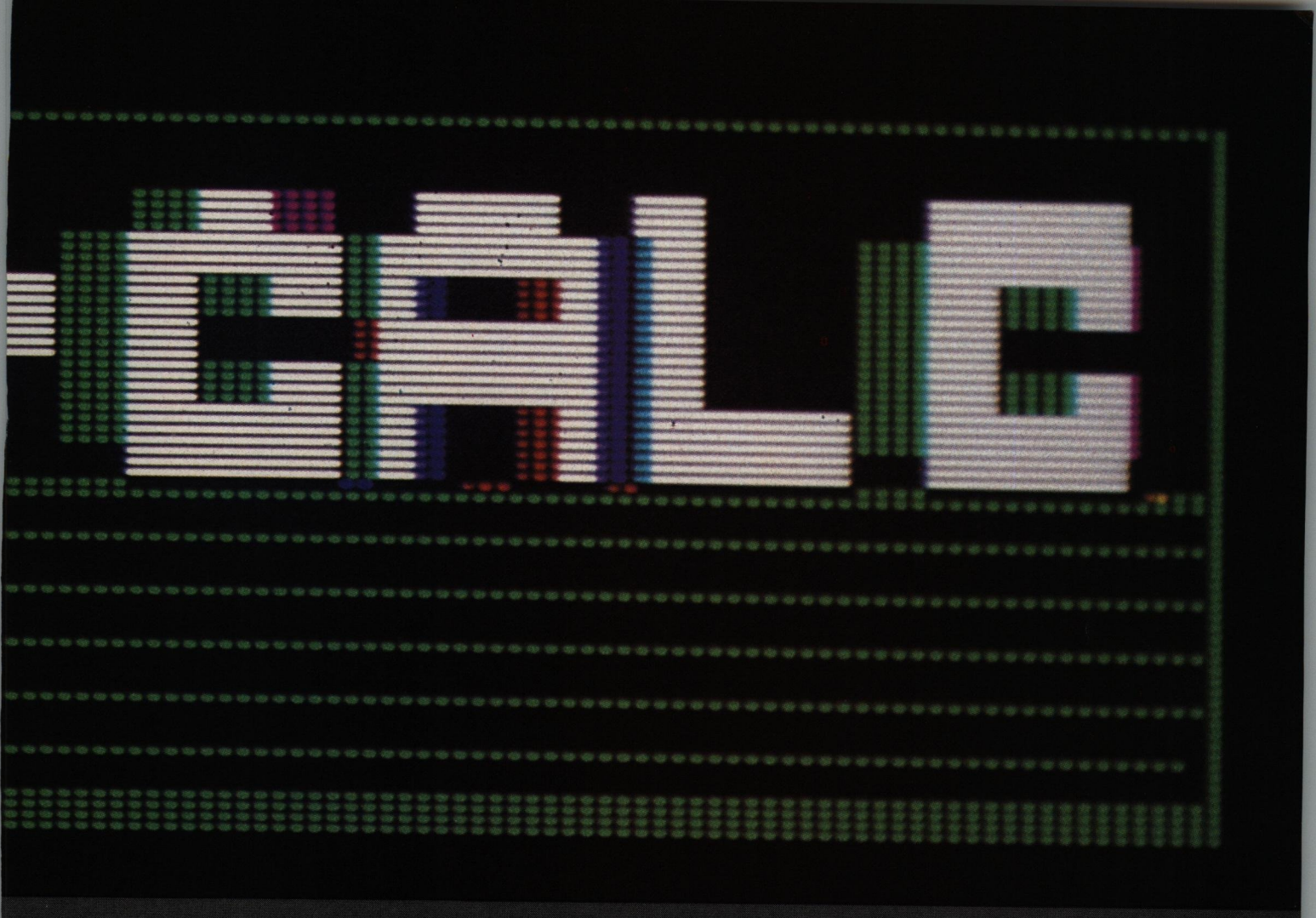
All activities on the Lisa operate conceptually and according to the same two rules: Select and Operate. You select the thing (be it a file, word, letter, number, or shape) you want to do something with; then you select the function you want to perform on it.

To select something, you move a pointer around on the screen using a small device called a "mouse" that you roll around on your desktop. Once you have the pointer positioned on your object, simply pushing a small button on top of the mouse "selects" the object, displaying it in reverse video, which, on the Lisa, is black.

Now you choose which operation to perform on your selection by moving the pointer up to the top of the screen to the "menu bar." The menu bar offers a variety of operational categories, each of which has subheadings. The subheadings do not normally appear on the screen, but they "unfold" when you position the pointer on a menu category and press the mouse button. After the particular menu selection unfolds, you move the pointer down to the desired operation and then let up on the mouse button. Voilà! It's done. That's basically all there is to operating the Lisa.

Any editing on Lisa varies little from program to program. Aside from the indispensable option called Undo Last Change for reversing a normally catastrophic mistake, the Edit menu contains a few other curious words: Cut, Copy, and Paste. When you "cut" or "copy" something, it gets stored on a temporary "clipboard" and waits to be "pasted" somewhere else. The difference between Cut and Copy is that Cut deletes the selection from your document and Copy replicates it.

To create a new spreadsheet, you just "pull off" a fresh piece of LisaCalc "stationery" by selecting a picture (called an "icon") of a pad of paper and clicking the mouse button twice. This action creates a new icon (document) labeled "Untitled," which you can rename later. Clicking twice on the new icon dramatically expands the small icon into a full-



screen grid of empty spreadsheet cells. Also, the menu bar changes and a status area appears (see figure 1).

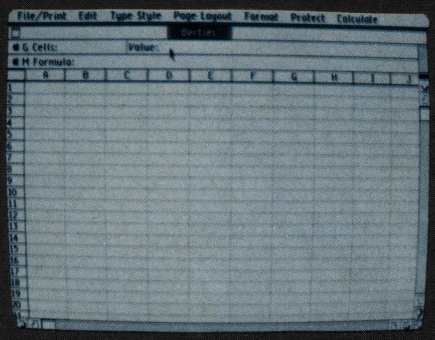


Figure 1: Here is how a blank LisaCalc document appears. Notice the menu bar and status area.

In addition to the usual menu bar and pointer, you can see three areas near the top of the screen: Cells, Value, and Formula. This area is referred to as the "status panel."

The Cells area performs two functions. It reports the location of the currently selected cell(s), or you can choose which cells you want to select by typing their coordinates in here.

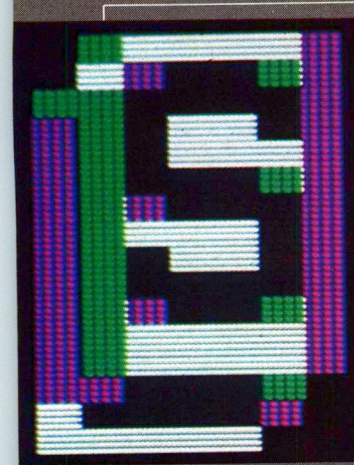
The Value area always displays the contents of the selected cell unless you select more than one cell. You can edit the selected cell's contents (value) either at this spot or in the cell itself. In either case, both areas simultaneously reflect any changes or additions.

Let's say you want to fill in cell B1. With most spreadsheets, you either have to use control keys to move the cursor to the desired location, or you can jump directly there by typing a special command. With the Lisa, you generally have several alternatives for selecting any object (in this case a cell). For example, there are three ways to select a cell: (1) Just move the pointer to the correct cell and click the mouse button. You can select a group of any number of contiguous cells this way. You can also select any particular row or column by moving outside the matrix and clicking on the row number or column letter. (2) Use the arrow keys located on the number keypad. (3) Or, press Apple-G (the Apple key and the G key simultaneously), which jumps the cursor up to the Cells area. Now you can enter the name of a cell (e.g., B4) or a range of cells to be selected (e.g., B4:B15, which means B4 to B15).

Now you have two choices. You can enter the *value* of the cell or you can enter its *formula*. To enter the value, you just begin typing on the keyboard. The value appears not only in the cell, but also in the Value area of the status panel. If you choose to enter a formula instead, you have two ways to get your cursor to the formula area for entry: (1) Position the pointer on the Formula area and click the mouse button, or (2) Press Apple-M, thereby jumping cursor to the Formula area, where it waits for input. I found the second method easier, since at this point I was using the keyboard anyway.

After typing in and/or editing either a formula or a value, you actually enter it into the spreadsheet by selecting another call or pressing Return, Enter, or Tab. The keys work as they would in a word processor. Return and Enter drop the cursor down one row and to the left margin; Tab moves you over one cell.

After following both the elementary and detailed tutorials that are part of the LisaCalc manual, I tried experimenting on my own. I created a new spreadsheet, a fictitious annual expense report for a company called Marston's Piano Shop. It's actually a



IMPLY PUSHING A BUTTON ON TOP OF THE MOUSE 'SELECTS' THE OBJECT, DISPLAYING IT IN REVERSE VIDEO, WHICH, ON THE LISA, IS BLACK.

very simple spreadsheet (see figure 2), but it was a good test of LisaCalc's data-entry and editing abilities.

The first thing I wanted to do was widen column A so that my descrip-

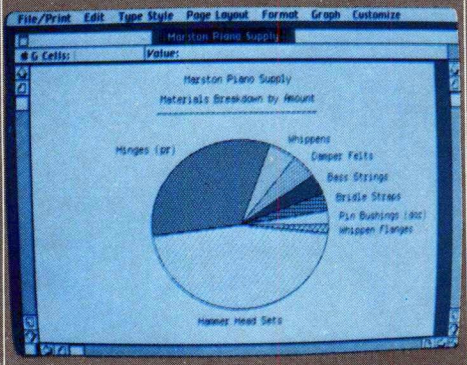


Figure 2: Data from a LisaCalc spreadsheet can be easily copied into other Lisa programs. Here you see statistics from a sample spreadsheet in a graphic printout by LisaGraph.

tions would fit in. This turns out to be simple with LisaCalc. I just positioned the pointer on the dividing line between columns A and B, pressed the mouse button, and moved the mouse until the column was as wide as I wanted. When I released the button, the screen reappeared with the correct column sizes. As a comparison, I tried this change on SuperCalc. The command was /F C A<CR> 20 <CR>. The same command in VisiCalc was equally awkward.

Inserting new rows and columns anywhere in the document is easy too. You just select a line between two rows, for example, move to the Edit menu, and choose Insert Blank Row.

Next, I began entering my titles and descriptions. The grid arrangement on the screen made this part easy, because I was not apt to select the wrong cell accidentally. For example, when using other "Calcs," I sometimes find it difficult to see which row an entry is on, especially if it is on the right side of the screen, furthest from the row marker.

In my example, typing in the formulas was relatively simple. I didn't use any complex equations, and most of the formulas were similar. Since LisaCalc, like most other spreadsheets, allows you to copy one formula into other cells while making adjustments for the change of location, you can eliminate a great deal of typing that you would have to do otherwise. It's even easier on the Lisa.

Let's take an example. My column D7 is entitled Subtotal. Its formula is B7*C7. (The * sign means "multiplied by.") Now, row 8 is going to use the same formula, but the 7's need to be changed to 8's. The formula for D8 should be B8*C8. Just copying the first formula of column D into all the other cells of column D without modifying each one would give erroneous results; a command called Paste Adjusting . . . comes to the rescue.

Paste Adjusting . . . is a variation of the Paste function, and the . . . after it means that you will have to answer a few more questions on a subsequent screen overlay if you select this option. This command enabled me to copy my formulas into other cells without any problem.

First I selected D7 and chose Copy from the menu. Then I selected D8 through D15 and chose Paste Adjusting. . . . LisaCalc analyzed the formula in D7, checked where I was going to copy it to, and concluded that I probably wanted the formula modified for each row. A new overlay appeared on the screen asking for confirmation and/or changes of any variables (see figure 3).

I left both variables relative, then clicked the "OK" square, and it was done. All eight rows I'd selected were now filled with their correct formulas and calculated. This feature is especially helpful with long equations and for creating spreadsheets with replicated formulas. Some other spreadsheets do provide these features, but they are more difficult to use.

In addition to the editing commands discussed above, LisaCalc offers a series of formatting commands (see figure 4). They let you modify both text and numerals in selected cells, or in the entire document.

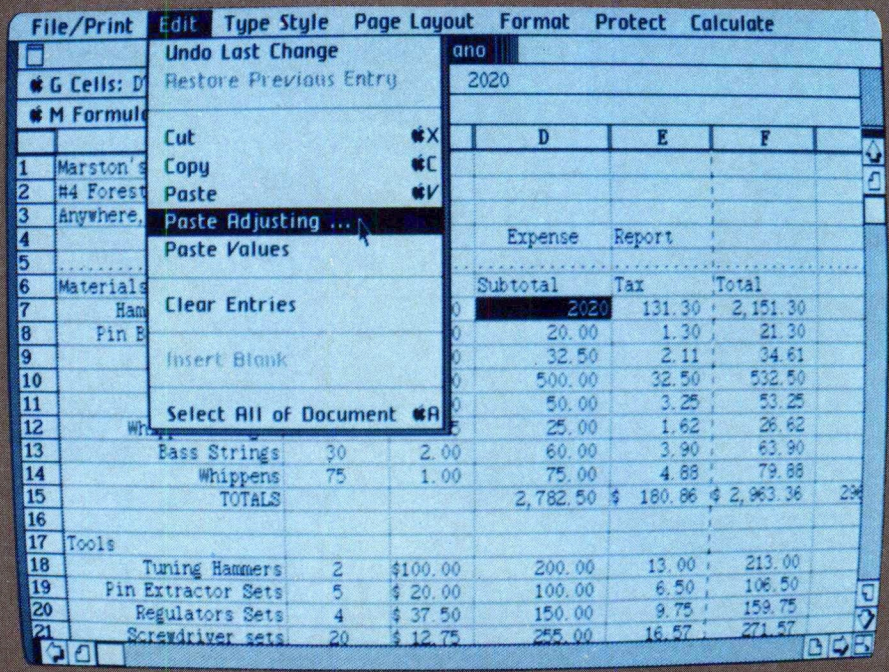


Figure 3: When you're pasting, using the Paste Adjusting . . . option, this overlay appears, asking for confirmation. This feature allows easy replication of formulas for use in other parts of a spreadsheet.

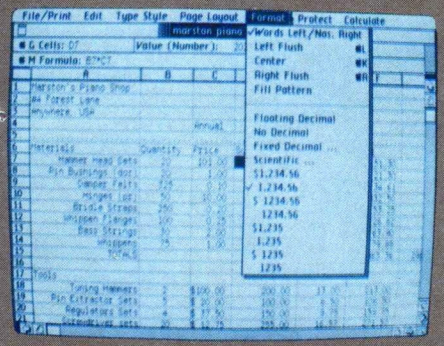


Figure 4: This is the Format Menu. LisaCalc provides for extensive modification of the way numbers and text appear on screen and on paper.

As you can see from the menu, you have several choices regarding the presentation of numbers. Initially, LisaCalc is set for floating decimals, text justified left, and numbers right. Fixed decimal places or no decimals at all are possible too. Regardless of the display format you choose, the program calculates numbers to 15 digits, stored in memory and reformattable at any time. All 15 digits appear in the Value area of the status bar when you select a cell, even though the cell (and printouts) will reflect only the formatted representation.

The Format menu also shows an example number, 1234.56, presented in its various optional formats. As you can see, you have quite a few choices.

You can use the Fill Pattern option for creating a row of, say, periods for dividing your spreadsheet into obvious sections. This technique seems to be the only function that is more cumbersome in LisaCalc than in other spreadsheet programs. It requires a six-step process instead of a two- or three-step one.

Another menu, Page Layout, offers the ability to insert page breaks between selected rows and to change column width by specifying the desired width in numerical form rather than by using the mouse.

The Type Style menu is of particular interest because of its ability to let you display many more rows and columns than most other spreadsheets do. In Figure 5, this contrast is quite obvious. Using small type, the screen can simultaneously display about 105 characters across and 28 rows down.

Text can be right- or left-justified, or centered. You have a choice of five type styles in four different sizes, and the ability to actually show the various type styles and sizes on the screen is an impressive bonus.

Spreadsheet calculation normally

File/Print Edit Type Style Page Layout Format Protect Calculate

marston piano

G Cells: Value:

M Formula:

	A	B	C	D	E	F
1	Marston's Piano Shop					
2	#4 Forest Lane					
3	Random, AK.					
4			Annual	Expense	Report	
5						
6	Materials	Quantity	Price	Subtotal	Tax	Total
7	Hammer Head Sets	20	101.00	2,020.00	131.30	2,151.30
8	Pin Bushings (doz)	20	1.00	20.00	1.30	21.30
9	Damper Felts	325	0.10	32.50	2.11	34.61
10	Hinges (pr)	50	10.00	500.00	32.50	532.50
11	Bridle Straps	250	0.20	50.00	3.25	53.25
12	Whippen Flanges	100	0.25	25.00	1.62	26.62
13	Bass Strings	30	2.00	60.00	3.90	63.90
14	Whippens	75	1.00	75.00	4.88	79.88
15	TOTALS			2,782.50	$ 180.86	$ 2,963.36
16						
17	Tools					
18	Tuning Hammers	2	$100.00	200.00	13.00	213.00
19	Pin Extractor Sets	5	$ 20.00	100.00	6.50	106.50
20	Regulators Sets	4	$ 37.50	150.00	9.75	159.75
21	Screwdriver sets	20	$ 12.75	255.00	16.57	271.57

File/Print Edit Type Style Page Layout Format Protect Calculate

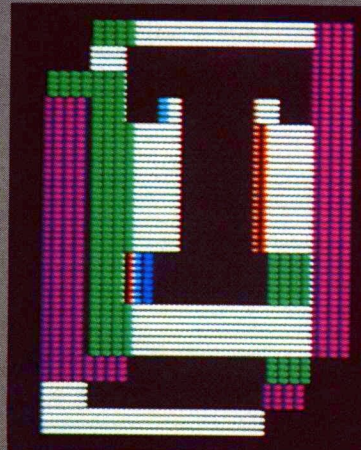
marston piano

G Cells: Value:

M Formula:

	A	B	C	D	E	F	G	H	I
1	Marston's Piano Shop								
2	#4 Forest Lane								
3	Random, AK.								
4			Annual	Expense	Report				
5									
6	Materials	Quantity	Price	Subtotal	Tax	Total			
7	Hammer Head Sets	20	101.00	2,020.00	131.30	2,151.30			
8	Pin Bushings (doz)	20	1.00	20.00	1.30	21.30			
9	Damper Felts	325	0.10	32.50	2.11	34.61			
10	Hinges (pr)	50	10.00	500.00	32.50	532.50			
11	Bridle Straps	250	0.20	50.00	3.25	53.25			
12	Whippen Flanges	100	0.25	25.00	1.62	26.62			
13	Bass Strings	30	2.00	60.00	3.90	63.90			
14	Whippens	75	1.00	75.00	4.88	79.88			
15	TOTALS			2,782.50	$ 180.86	$ 2,963.36	2963.3625		
16									
17	Tools								
18	Tuning Hammers	2	$100.00	200.00	13.00	213.00			
19	Pin Extractor Sets	5	$ 20.00	100.00	6.50	106.50			
20	Regulators Sets	4	$ 37.50	150.00	9.75	159.75			
21	Screwdriver sets	20	$ 12.75	255.00	16.57	271.57			
22	Repinning Sets	5	$ 15.00	75.00	4.88	79.88			
23	TOTALS		$185.25	$ 780.00	$ 50.70	$ 830.70	830.7		
24									
25									
26					Grand Total	$ 3,794.06			
27									

Figure 5: These two screen photos show the differences in spreadsheet viewing areas obtainable through use of the Type Style menu selections.



HE TYPE STYLE MENU IS OF PARTICULAR INTEREST BECAUSE OF ITS ABILITY TO DISPLAY MORE ROWS AND COLUMNS THAN MOST SPREADSHEETS DO.

takes place whenever you make a change in any crucial cell's value. The Calculate menu gives you a choice of either manual or automatic calculation, however, which is necessary to help you avoid long waits between calculations when you're changing several variables in large spreadsheets.

The ubiquitous "what if?" analysis that so many people use spreadsheets for is especially informative in LisaCalc, because each affected cell is temporarily highlighted to indicate where changes may occur—an impressive feature for financial analysis.

As with any spreadsheet, the usual mathematical, logical, lookup, and trigonometric functions are built into LisaCalc. In addition, a host of others are available, including net present value, compound-interest factor, and annuity factor.

Testing spreadsheet speed isn't a simple matter, since some types of calculations will undoubtedly take longer than others. But just for grins, I created a matrix 10 columns wide by 100 rows and gave each cell the formula ((A1*B1)+2)/pi. Variable A1's value was 456789; B1 was 123456.5564. The calculation and redrawing of the screen took 19.5 seconds, which comes to 2/100 of a second per cell. The redraw probably accounts for most of this time—I have noticed that the screen tends to be slow anyway. The possibility of any spreadsheet containing 1000 cells that would all be affected by a change in one other cell is remote anyway, so this speed figure is quite respectable.

Once you are done entering data, printing it out, either on the Apple dot-matrix or daisy-wheel printer, is simple but slow. After you select the Print option for the File/Print menu, an overlay appears that asks how many copies you want, whether you want high or normal resolution, and which pages of the document you want printed. You have an option of a horizontal or vertical printing arrangement. Finally, you have to tell the program whether you want to continue working on the spreadsheet or another document while printing occurs.

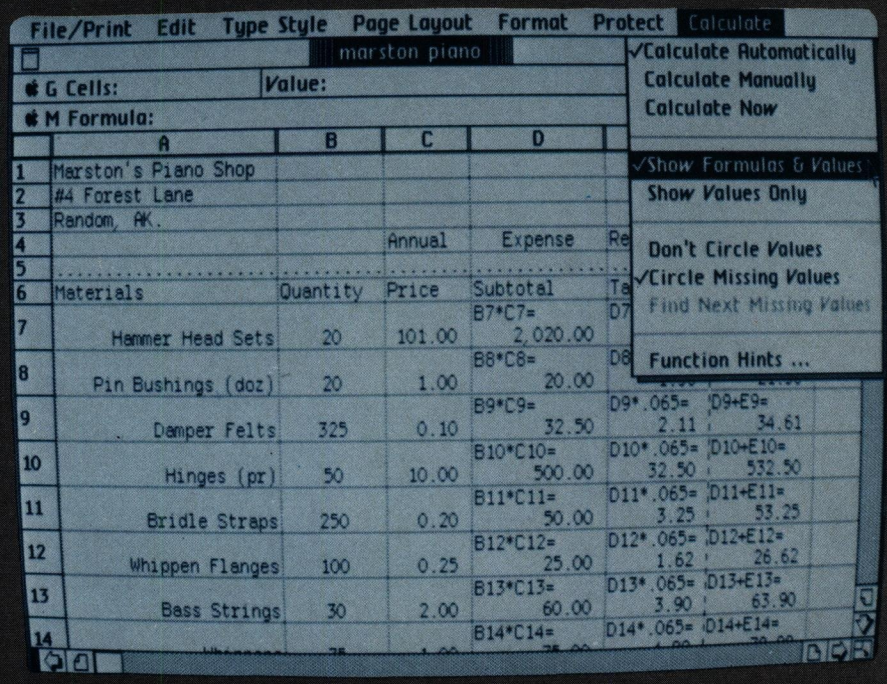


Figure 6: Screen appearance when both formulas and values of cells are displayed.

OTHER FEATURES

LisaCalc has too many other features to cover in detail, but here are some highlights.

One surprising aspect of LisaCalc is its ability to create spreadsheets of up to 255 columns by 255 rows. The resultant number of cells should allow financial analysis of extremely complicated business prospects. As a comparison, SuperCalc 1 allows 58 columns by 254 rows. Microplan allows only 50 rows and 20 columns. Spreadsheet size is calculated automatically by LisaCalc, eliminating any need for premeditation on your part.

Another useful feature is the ability to display formulas and values of selected cells simultaneously. It lets you see quickly just what's going on in your spreadsheet and possibly correct any formula errors. LisaCalc also does a good job of reorganizing the screen and printouts to display all the information you add (see figure 6). In the printout, cells are actually boxed in, just as they appear on the screen when this function is active. Most spreadsheets allow you to split the screen in order to see two areas of one document at the same time. With LisaCalc, you can split the screen both horizontally and vertically at the same time and scroll each section independently. In addition, thanks to the Lisa operating system, you can have almost any number of documents on the screen simultaneously—until the screen becomes too crowded. This simultaneity makes copying sections from one spreadsheet to another easy.

LisaCalc can figure out how to use dates or parts of dates in calculations and formulas—an important feature for project scheduling. Here are some examples:

```
''9/5/47''+10000 days = 1/
  21/75
''12/25/83'' - ''3/31/83''
  = 269 days
4*Int(3 weeks) = 12
''Date - ''1/1/83'' = days
  since beginning of 1983.
```

S WITH ANY SPREADSHEET, THE USUAL MATHEMATICAL, LOGICAL, LOOKUP, AND TRIGONOMETRIC FUNCTIONS ARE BUILT INTO LISACALC.

(Lisa's internal clock/calendar replaces the word Date with today's actual date.)

Finally, LisaCalc allows you to create templates for data collection that data-entry people who do not need to learn LisaCalc can fill in. You do this by creating a "stationery pad" of a LisaCalc document that has important values protected and missing values circled. By "protecting" all the other fields, you can prevent accidental overwriting of key cells.

This scheme is a nice idea for data entry, but some other spreadsheets that can actually run programs, even to the point of printing out results of a recalculation without user initiation, are more automatic.

DOCUMENTATION

All the LisaCalc manuals are beautifully designed and thought out, and this one is no exception. The first section is a simple tutorial that orients you and gets you doing real work with LisaCalc. When you are ready for more, the second section walks you through an in-depth tutorial covering all phases of LisaCalc. Section 3 contains a detailed reference guide to all functions. LisaCalc even includes instant on-screen documentation that lists all the functions, operators, and constants with examples showing syntax. You can call up this information even while you're in a document.

My only complaint about the manual is that it is too technical and moves too fast, which is probably fine for a businessman who understands financial modeling. For the layperson just learning about spreadsheets, the documentation does not include enough explanation of what is going on and why one would do all the calculations. Pictures and examples are plentiful, however. Five sample worksheets come on the disk, and the instructions are clear, which is more than most other manuals can offer.

CONCLUSIONS

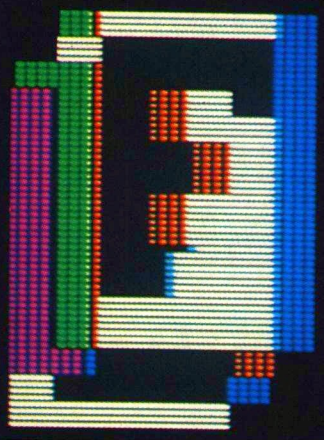
Lisa's visually oriented operating system lends itself neatly to the creation and maintenance of spreadsheet documents.

The mouse and the extended screen display make all the difference. The ability to select a specific cell, row, or column and then move it around, increase or decrease its size, edit its value or formula, change its format, and automatically recalculate—all in a few seconds—can take the drudgery out of financial planning.

LisaCalc doesn't do everything other spreadsheets can do, but it is easy—even fun—to use, and it has some features you can't find anywhere else. Except for loading in and saving files, the program runs reasonably fast (see operating system and program loading times below).

1. *Booting up the Lisa operating system: 1 minute, 38 seconds.*
2. *Opening an existing LisaCalc file from the hard disk: 47 seconds.*
3. *Opening the same file, but from the desktop: 8 seconds.*
4. *Closing that file: 7 seconds.*
5. *Creating a new document: 12 seconds.*

The ability to port your data over to LisaGraph (see *A+*, Volume 1, Issue 2) is certainly something to consider if you need high-resolution printouts of your data. The price is high ($6995 for Lisa, $295 for LisaCalc), but you may find the combination worth it. ✚



IVE SAMPLE WORKSHEETS COME ON THE DISK, AND THE INSTRUCTIONS ARE CLEAR, WHICH IS MORE THAN MOST OTHER MANUALS CAN OFFER.

A + REPORT CARD

Training time	: A
Hardware ease of use	: A
Software ease of use	: A
On-screen messages	: A
User friendliness	: A
Documentation	: B
Speed	: C
Overall performance	: A

LIST PRICES:

Apple Lisa	Including a 5-megabyte hard disk, 2 860K floppy-disk drives, and mouse. No printer. $6995
Dot Matrix Printer	For printing out your drawings. Has 80 columns. $675. Requires an extra parallel interface board, which costs $195 additional.
Daisy-Wheel Printer	Prints in letter quality and also will print graphics, though the Dot-Matrix printer is recommended for graphics. $2195
Software:	Complete package of six Lisa Applications, the Six Pack, is available for $1195.
	Six Pack with Dot-Matrix Printer and parallel-interface card is $1495.
	LisaDraw $395 LisaProject $395
	LisaWrite $295 LisaGraph $295 LisaCalc $295
	LisaList $195
	COBOL $995 BASIC $295 DecBASIC plus Pascal $595 Compiled

Introducing the new Topo,™ world's first personal

"I invented Topo for you--- whether you think of yourself as a programmer, robot hobbyist, or futurist."

Nolan Bushnell

NOLAN BUSHNELL

Founder of Atari and Androbot; father of the personal robot

"A lot of Apple® owners are sure to appreciate all that Topo stands for, and all the things he can be programmed to do. They should get our first 500."

robot, available in a limited Signature Edition

AN EXTENSION OF YOUR COMPUTER. AND TALENT. AND IMAGINATION.

One day, when there is a robot in every home, most people will ask themselves, "Why didn't I?"

A few others—mostly today's creative programmers and educators—will say, "I'm glad I did!"

Androbot invites you to help shape technological history by being one of the first to own and command Topo, the world's first personal robot.

TOPO CAN WALK...TALK... SING AND MORE. ALL AT YOUR COMMAND.

You program Topo's movements and speed via joystick or keyboard commands. You tell him what to say to you, your family, students, or guests. In English, Spanish, Japanese—almost any language on earth.

Movement is programmed on a system of degrees and centimeters, displayed on your screen. Text-to-speech synthesis is adjustable for pitch and volume.

TOPO'S INNER ELECTRONICS MAKE HIM VERSATILE AND EXPANDABLE.

Three 8031 microprocessors serve as Topo's "brains." Two industrial-grade rechargeable batteries give him energy for hours of activity. His battery monitor provides voltage protection.

Topo's edge-mounted plug-in card cage system contains one board for motion control and another for two-way communication.

Six additional slots will accommodate the numerous optional functions available soon, such as touch sensors, ultrasonic sensors, and even an infrared bar code reader. Navigational ability can also be incorporated soon, with technology currently under development at Androbot.

TOPO ARRIVES BUNDLED FOR ACTION.

You provide Topo's host computer: Any Apple® IIe, or II+ with RS-232 interface (super serial card) disk drive, and joystick.

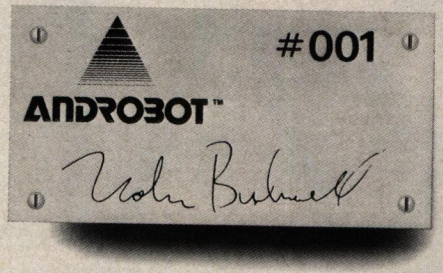
(Versions of Topo designed to interface with IBM PC,® Commodore,® and Atari® computers will be available by Spring, 1984.)

Your robot comes ready for use, with TopoSoft,™ a high-level, easy-to-use language based on Forth. Plug Topo's base communicator into the RS-232 port of your Apple,® and your messages become commands transmitted to Topo via his two-way infrared link.

Optional software includes an Androbot extension package for AppleLogo,™ to let you program Topo's maneuvers in that popular educational language.

Optional TopoTeach™ will enable your robot to save and remember a complex series of commands. Topo's optional AndroWagon™ can carry beer, books, toys, or your guests' coats and hats from room to room.

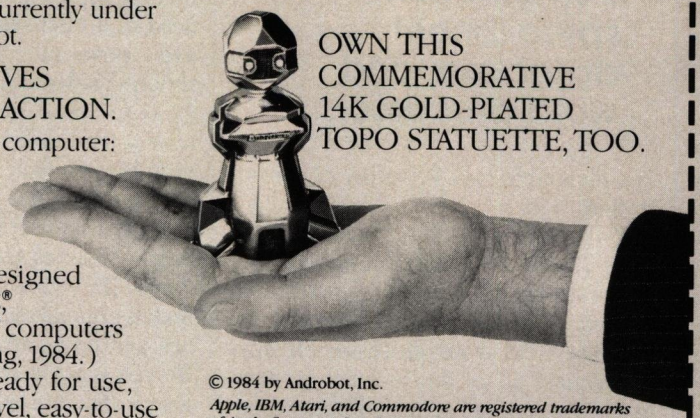
Your Androbot dealer offers Topo software and accessories, as well as service.



ANNOUNCING THE SIGNATURE EDITION FOR THE FIRST 500 WHO BUY TOPO.

Each Signature Edition Topo will bear an engraved plaque signed by his inventor, Nolan Bushnell. Your Topo will be numbered and registered in your name, commemorating your leadership in the Age of Androbotics.

There will be more Topo personal robots after this special limited edition is gone—but why wait? Order today by phone or by mailing the coupon below, for guaranteed delivery through your authorized Androbot dealer. Or better yet, see him now. You may find Topo already at his store.



OWN THIS COMMEMORATIVE 14K GOLD-PLATED TOPO STATUETTE, TOO.

© 1984 by Androbot, Inc.

Apple, IBM, Atari, and Commodore are registered trademarks of Apple Computer, Inc., International Business Machines Corp., Atari, Inc., and Commodore Electronics Ltd.

CIRCLE 243 ON READER SERVICE CARD

Nolan Bushnell
ANDROBOT, INC.
P.O. Box 9-214
San Jose, CA 95103

YES, I AM in the Age of Androbotics. Please send the following:

QUANTITY		TOTAL
___	Topo personal robots, compatible with Apple IIe or II+ computer. Ship to my nearest Androbot dealer, who will notify me of arrival in 4 to 6 weeks. $1595 each.	$_____
___	Topo Owner's Manual. $25 each; refundable with later purchase of Topo. (Included at no charge with Topo.)	$_____
___	14K gold-plated Androbot statuettes, 3⅓ inches high, 1¾ pounds. Postpaid, $100 each.	$_____
___	Androbot T-shirts. Postpaid, $10 ea. Adult S ☐ M ☐ L ☐ XL ☐ Child S ☐ M ☐ L ☐	$_____
___	"Androbot Report" newsletter. One year $15. (Free with purchase of Topo.)	$_____
___	And please add my name to the new Topo Users Group mailing list.	$ N/C
	California delivery only: Add 6½% sales tax to the total above.	$_____
	Shipping and handling, Topo only: $45 each. (To dealer in Hawaii or Alaska: $65 each.)	$_____
	TOTAL	$_____

For residents of continental United States, Alaska and Hawaii:

TO ORDER BY PHONE, call (408) 262-4914 between 8am and 6pm Pacific Standard Time and give code 100 and the credit card information requested below.

TO ORDER BY MAIL, enclose cashier's check or money order, or charge to:
Visa ☐ MasterCard ☐ Diner's Club ☐
American Express ☐ Carte Blanche ☐

Card # _____

Expiration date _____

Cardholder's signature _____

Name (Print) _____

Address _____

City _____ State _____ Zip _____

Home phone ( ) _____

Daytime phone ( ) _____

Offer available only through participating Androbot dealers in the U.S. Signature Edition limited to the first 500 Topo personal robots produced for sale. This direct offer expires February 29, 1984. Specifications and prices subject to change without notice.

For residents of Canada: contact Prestige Electronics, Rexdale, Ont. (416) 674-1433.

ANDROBOT™

JACK OF ALL TRADES

The Incredible Jack, Version 1.3
Business Solutions, Inc.
60 East Main Street
Kings Park, NY 11754
(516) 269-1120
List Price: $179 plus $30 for Customer Support Hot Line
Requires: Apple II, II Plus, or IIe;
64K RAM;
two disk drives;
DOS 3.3;
80-column board (optional);
printer

Integrated software has become a popular buzzword recently. Microcomputer users are not content with separate spreadsheet, database, and word-processing programs anymore, even though they used to get the job done. Now, users are demanding software that is compatible with other products. They see no reason why their word processor should not perform calculations and why information from various data files shouldn't glide into form letters to produce calculated results at the same time. In short, now that they are familiar with the power of basic microcomputer software, they see the need for their software packages to communicate in an integrated fashion.

For newcomers to the micro market, the prospect of a single product that can do the job of three "traditional" programs for a single price makes the idea of integrated software financially attractive. For experienced users seeking to avoid entering the results of calculations and database records by hand and for novices on a limited software budget,

Do not expect this program to perform as if it were a combination spreadsheet, database, and word processor.

The Incredible Jack is worthy of consideration.

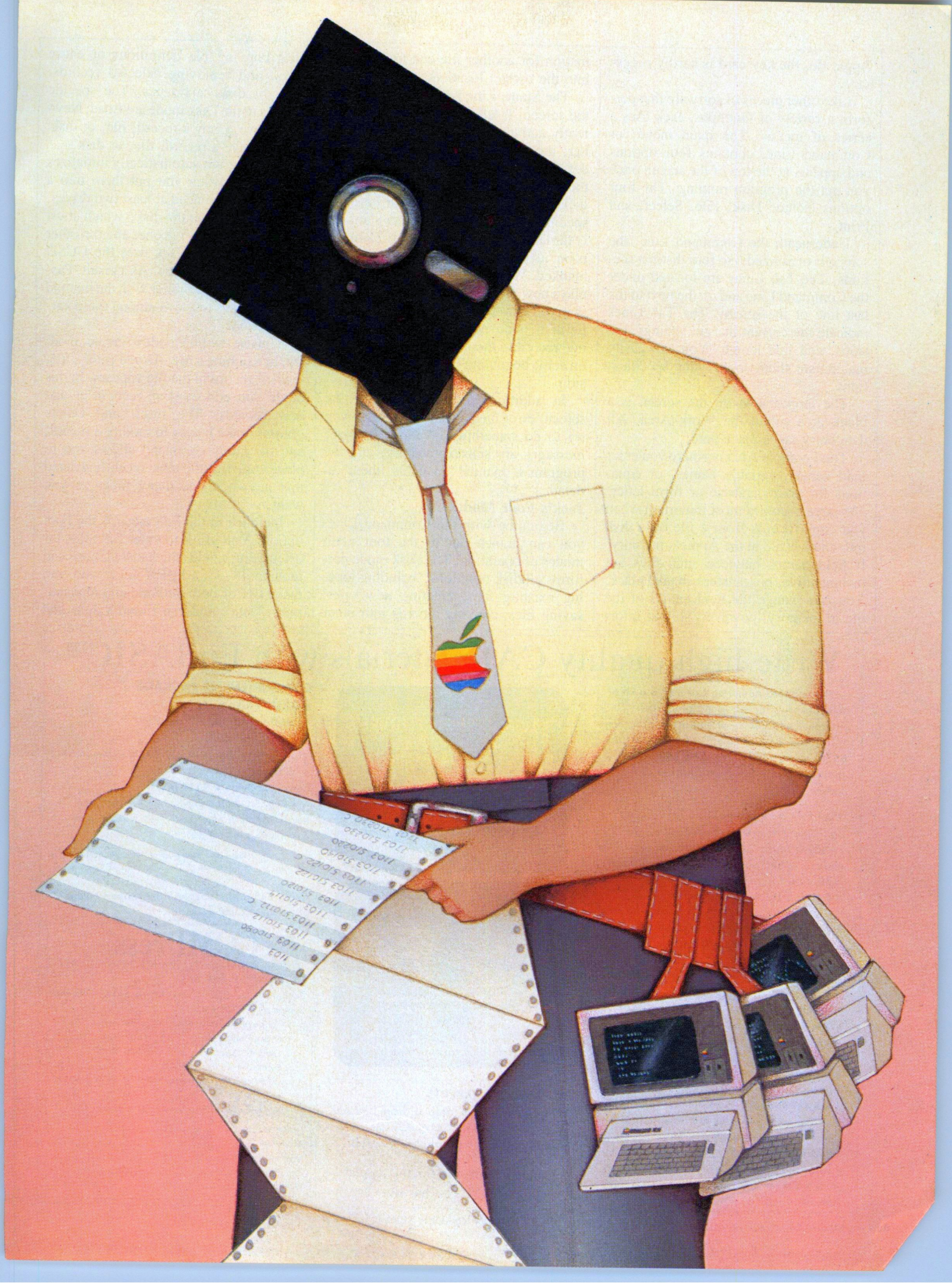
To describe Jack as an integrated piece of software is accurate enough, but do not expect this program to perform as if it were a combination spreadsheet, database, and word processor. It does not contain all of the features of state-of-the-art versions of each of these products. Jack is best described as an enhanced database-management system that lets you perform calculations on a defined field and merge those fields plus the results into forms or letters you have created with its word processor.

Jack will not replace our favorite word processor for tasks involving text composition and editing, nor will we throw away our favorite spreadsheet program when it comes time to determine the possible impact of pending salary negotiations. It is not a substitute for such dedicated products with their many special features.

On the other hand, individuals with small businesses that require billings or mailings of a similar nature, or anyone in need of a micro database that is easy to use, powerful, and well supported should read on. If you have less than $200 to spend on software, we would have a hard time recommending a more versatile product.

The House That Jack Built

You can use Jack with any of the Apple II-series computers. We used an Apple IIe with an 80-column board that makes optimal use of the Tab key and the up- and down-arrow keys. Without the IIe you must learn a set of control characters that are a bit less obvious and require that you consult the enclosed "key card" frequently at first. With the



Apple IIe, the key card is hardly necessary.

Like other pieces of software that perform a variety of functions, Jack uses a series of menus. The main menu, or Command Line, contains four options and appears at the top of the screen once you get the program running. The four options include Disk, File, Select, and Print.

Underneath the Command Line, the screen is organized into four distinct sections. The Tab Lines are located under the Command Line and on the next to the last line of the screen. The Tab Lines indicate the current margin settings, tab stops, and line length. You can easily manipulate them to fit your specifications.

The largest area on the screen is a blank area called the Work Area. All data entry takes place here.

The Footnote Area is where you enter field names, variable names, or equations for your database or form letter. This area becomes most important when you copy records from a file on a disk into another file in the Apple's memory. If field names between such files are incompatible, no transfer can take place. You can change the field names of the file in memory, however, so that information for another file can find its way into the correct location.

The Status Line is the bottom line on the screen. It tells you the filename currently active; record number; line number; the current field indicator, whose default value is the colon; the format for the field values; whether or not a file is locked so that you can begin entering specific data; and whether auto-blanking is turned on or off. When auto-blanking is on, all data from the previous record is blanked. When it is off, the program displays new records with the old values so that you can avoid retyping entries into fields that do not always change from one record to the next. Auto-blanking is on at the beginning of any data-entry session.

In addition to these areas on the screen, error messages appear when you try to do something invalid. The error messages are self-explanatory, and the program's manual explains them in detail.

Jack's Four Modes

Beginning with the Command Line, you can branch out to the four main modes of operation. The Disk mode performs all disk functions, including loading existing files; creating new ones; saving files; copying records into other files; copying file definitions or entire disks; and removing selected records, files, or disk catalogues. The specific options in the Disk mode are Load; Newdisk; Save; Copy a record, file, or disk; and Remove a record, file, or disk.

The program automatically initializes blank disks when you put them into a disk drive. You need at least two drives, one for the program disk, which must always reside in drive one, and the other for the data disk. Jack uses the UCSD Pascal run-time system. As a result, Pascal users will be familiar with the method that Jack uses to move among these various options.

You use the File mode to create, modify, or examine a file. As you enter a file, the first record in the file appears. In this mode you edit existing records or add new records. The Insert and Delete options make it easy to modify a record, and the Copy command allows you to place copies of the most recently deleted text anywhere, as many times as you want.

Included in the File mode is the Foot option. You use it to enter formulas for calculating a field. Such calculations can include IF . . . THEN logic and can make use of both numeric and alphanumeric data. You can round values and

Write high quality CAI materials with EnBASIC™

The EnBASIC Authoring System™ is a kit of software tools for increasing production efficiency and quality of interactive programs.

It acts as an add-on or "enhancement" to BASIC giving you full access to BASIC plus special graphics, input, and answer commands.

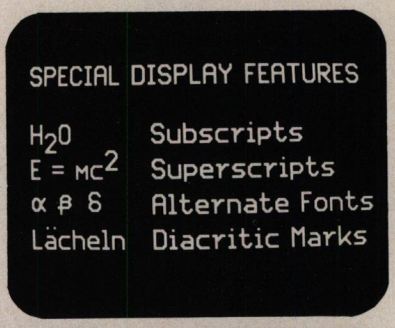
Rated A+ by **Peelings II**

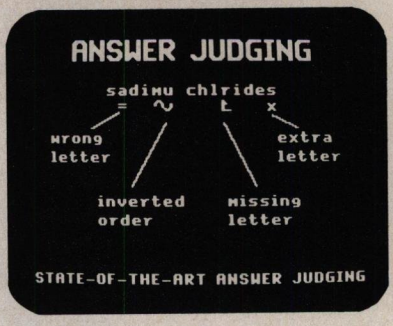
"... There are extensive appendices, an excellent index, sample programs on diskette, a self-paced demonstration, consideration for varying character fonts, and a readable style in the manual. I would recommend this package to those educators who enjoy programming and have a need to write interactive tutorials and testing programs."

John Martellaro, **Peelings II**
Volume 4, Number 5

UNIQUE FEATURES

- **User-Friendly Input** - Students type and edit responses easily ... upper or lower case, sub- or superscripts, and special language diacritic marks are all available for text or student response.
- **Answer Judging** - Variations in spelling, wording, or word order are accepted, with immediate feedback on errors.
- **Spelling Mark-Up** - Character-by-character feedback for missing, extra, or wrong letters, inverted letter order, errors in accents, capitalization, sub- or super-scripting.





DESIGNED BY EXPERTS

Authors Paul Tenczar, Stanley Smith and Allen Avner have produced CAI and similar user-oriented software for more than 20 years.

"Good" Software for the Apple? COMPress has it!

COMPREHENSIVE PACKAGE

EnBASIC consists of:

1. Master and back up diskettes
2. A 94-page manual
3. A Pocket Guide to key EnBASIC commands
4. A demo diskette

Complete System $150.00

The EnBASIC Authoring System™ is designed for the Apple II plus and //e* with at least 48K memory and 3.3 DOS.*

*Registered trademark of the Apple Computer
™ Trademark of Computer Teaching Corporation

Order EnBASIC today...use the coupon below, or contact COMPress today!

COMPress A Division of Van Nostrand Reinhold
P.O. Box 102, Wentworth, NH 03282
(603) 764-5831

Send me _____ copies of the EnBASIC Authoring System at $150.00 each.
( ) My payment is included with order.
( ) Charge my VISA _____ or Mastercard _____
Card # _____ Exp. Date _____
Signature _____
COMPress pays postage/handling on all prepaid orders.
( ) My authorized Purchase Order is attached.
Name _____
Affiliation _____
Address _____
City/State/Zip _____
Telephone _____ A+1/84

CIRCLE 194 ON READER SERVICE CARD

HOW TO UNSCRAMBLE YOUR NEST EGG.

It doesn't take a computer to tell you that money can't buy you happiness.

But at last there is a piece of personal computer software that will make you a lot happier about your money.

And you're looking at it.

Making sense of your dollars.

Dollars and Sense™ is designed to save you money by organizing your money. By giving you the clearest picture you've ever had of your financial behavior.

It can establish budgets along any lines you like. Monthly or annually, fixed or variable. On up to 120 accounts.

It can write checks, make transactions automatically. Even remind you to pay your bills.

And as time goes by, it tells you exactly how you're doing. With a complete set of reports and full-color graphs* that come up on screen or print out on paper. At the touch of a key.

And all you have to do is spend a few minutes each week telling your IBM® PC, Apple® II or IIe what came in and what went out.

User friendly. Really.

Dollars and Sense also happens to be very easy to use. For everyone who uses it.

If you're a novice, at computing or accounting or both, don't worry.

The interactive demonstration disk will get you started. And the program will keep you going. With sample accounts, on-screen prompts and a user's manual that's written in plain English.

And one more thing. Dollars and Sense is tax-deductible.

But only if you use it on your taxes.

MONOGRAM™

CIRCLE 300 ON READER SERVICE CARD

8295 South La Cienega Blvd., Inglewood, CA 90301 213/215-0529

Apple is a registered trademark of Apple, Inc. IBM is a trademark of International Business Machines. *Color monitor required.

change variable names.

You can use the GOTO option to hop around within a file. The program lets you change global settings for such things as tabs and margins. You have to save each new record or edited record separately.

The Select mode lets you enter criteria for searching a specific set of records for your file. With this mode, you can sort, print, or merge selected records into a form that you created as another file. You can use Boolean logic, with its ANDs, ORs, and NOTs, for selection; wild-card characters can help you locate a specific string of characters.

In the Select mode, you can do a high-speed search on the first field you created in a file. This procedure is called a key search, and the field name should be unique. Other secondary searches are possible but slower. Thus, make sure that you choose your first or key field carefully.

The Print mode allows you to print the results of your work. Jack can print a little memo, a simple calculation, or a complex merging of selected records from one file into a form letter. It can also take some of the merged fields you've used in calculations and sort them by ZIP code for bulk mailing. The Print menu gives you several options to determine how the printed material will appear on paper or on any special forms that you care to feed into your printer.

Unlike some other packages, Jack allows you to send coded messages to your printer so that you can turn on special character sets, line spacing, or any other features that your printer allows.

Jack allows you to send coded messages to your printer.

As Epson FX-80 owners, we found this feature especially valuable.

Is Jack Really a Big Deal?

Since this program's abilities are limited by the Apple's internal memory and disk space, you should note just how big your files can be. Each Jack data disk can have up to 60 different files. They can vary from short notes or scratch-pad calculations to data bases that fill the disk with a single file. Any single file can contain up to 1000 records. If your business booms, be prepared for a conversion to a larger computer system.

A single record can have up to 100 fields totaling approximately 2000 characters, depending on the setup and on how many footnotes you use to describe calculations. Any single footnote that defines a calculation can be as long as 240 characters long; 20 digits are maintained in all calculations. The round-off error causes the last few figures to be meaningless, however. These numbers compare favorably with those of other database products we have used.

The House of Jack

Jack's single disk and 125-page 5¾-inch-square manual come in an attractively labeled disk box just like one you might purchase to carry about ten disks in. The manual contains a tutorial section that guides you through the creation of a letter, a form that serves as the model record for a data file, a simple form that contains five fields and four calculations, a letter with embedded calculations, and mailing labels. The mailing-label tutorial represents a simple version of merging records from one file into another.

The manual's reference section explains in detail how to use each of the four modes and accompanying options. The appendices help with error messages, warn you about Jack's maximum

LOCK-IT-UP

DISKETTE COPY-PROTECTION
AND DUPLICATION SYSTEMS
FOR THE APPLE COMPUTER

The Lock-It-Up systems are sophisiticated, menu driven copy-protection and duplication utilities for the Apple II Computer. They feature several levels of protection which make standard diskettes virtually uncopyable by even the most sophisticated nibble copy programs currently available.

- All sectors on the diskette can still be used.
- Data files can be loaded and/or saved to either the protected diskette or an unprotected diskette.
- Memory will be cleared and the disk will reboot if the reset key is pushed.
- The copying systems support up to 14 disk drives.
- Complete data-verification is optional during copy.
- Sequential serial numbers are assigned to each diskette produced by the system
- Master diskettes created with the system contain an I.D. stamp that you select. The I.D. stamp must be correctly specified before any diskettes can be duplicated. This prevents other Lock-It-Up owners from copying your diskettes.
- Extensive support is provided should you have any problems or special needs.
- Our system is supported by numerous disk copying services should you need a large quantity of diskettes duplicated.

DOS or Pascal systems are available for $225 each. CP/M system is available for $695. Each system includes three diskettes, an informative manual, and a non-exclusive license to copy as many diskettes as needed.

DOS VERSION:

- Any standard DOS 3.3 diskette can be protected.
- DOS command names can be changed and/or deleted.
- Autorun can be used to prevent the listing of a program or the use of any basic commands outside of a program.
- A faster DOS can be used in order to decrease disk access time by up to 50%!

REQUIRES: 48K Apple II or II+ with Applesoft in ROM or language system and at least two disk drives.

PASCAL VERSION:

- Any standard Apple Pascal 1.1 diskette can be protected.
- Files may be transferred to a standard Pascal diskette, but they will not run unless they are on the protected diskette.
- Easily added to any program by use of a Regular Unit.
- Compatible with Apple Fortran.

REQUIRES: Apple Pascal and at least two disk drives.

CP/M VERSION:

- Any COM file may be protected
- Additional CP/M utilities included
- Protected files may be backed-up by user

REQUIRES: 64K Apple II with Z-80, 56K Microsoft CP/M and at least two disk drives.

ORDER NOW! Call collect for COD, Mastercard or Visa orders

DOUBLE - GOLD
SOFTWARE, INC.

4010 Moorpark Ave., Suite 207
San Jose, CA 95117
(408) 554-9133

CIRCLE 111 ON READER SERVICE CARD

Videx INC TM

OPEN YOUR APPLE TO A WORLD OF COMMUNICATION

Videx' new PSIO Dual Function Interface Card gives you a whole new world of communication... with a whole new ease of operation.

The PSIO allows you to use a printer (parallel output) and a modem (serial I/O port) simultaneously, through use of just one card! But best of all, the PSIO makes communicating through either method worlds easier than it's ever been before.

The PSIO lets you choose from among an unmatched range of software-selectable options, including variable baud rate selection, form width, form length, auto linefeed, linefeed mask, Xon/Xoff protocol, lowercase masking, shift wire mod support, duplex mode, parity, data format, video echo mode and a slot echo mode.

PSIO can also open up new worlds for graphics, since it can reproduce your picture on any graphics printer. Rotate your picture, enlarge it, change it as you wish.

Once you've chosen your options, the PSIO's highly sophisticated NOVRAM (non-volatile RAM) will remember and permanently save them. That means *you* won't have to give the same configurations over and over again ... your PSIO will do it for you. And if you want to *change* those configurations, you can do it through software instead of through the confusing array of switches that other cards use.

The PSIO will work with any printer/modem you now happen to own... and it will work with any printer/modem you happen to purchase in the future. Adaptable? Definitely!

The PSIO is completely compatible with BASIC, Pascal and CP/M® systems.

The PSIO from Videx... how in the world can you do without it?!

CIRCLE 141 ON READER SERVICE CARD

897 N.W. Grant Avenue, Corvallis, OR 97330 503-758-0521

Apple is a registered trademark of Apple Computer Inc.

Now a professional CAD system for $1,095!

For Apple II and //e

Finally, there is a breakthrough in computer aided drafting and design that makes this work-saving technology affordable for every school, architect, engineer, designer and draftsperson.

The new Robographics CAD-1 system works with a standard off-the-shelf Apple* II+ or //e computer. A complete CAD-1 hardware and software package sells for $1,095, and you can add a drafting plotter for as little as $1,495!

Yet, this is a serious drafting and design system emulating other CAD installations costing over $15,000.

CAD-1 utilizes a unique handheld controller which serves as both drawing instrument and function selector . . . there are no key-

stroke commands to interrupt the workflow. And, when the drawing is completed, line work of reproduction quality can be plotted on paper, vellum or drafting film.

The easy-to-learn CAD-1 drafting process is fast, efficient and highly productive.

To preview this remarkable system, send for a free CAD-1 brochure, or send $17 for your advance copy of the CAD-1 User Manual. Credit will be given when you order a system.

Major credit cards accepted.

See your Apple dealer today for a demonstration or contact us directly.

ROBO GRAPHICS

CHESSELL-ROBOCOM CORPORATION
125 Pheasant Run, Suite 2B
Newtown, PA 18940 (215) 968-4422

*A registered trademark of Apple Computer, Inc.

CIRCLE 183 ON READER SERVICE CARD

capacities, and explain rules for calculations in detail. Several complex but standard business calculations are included, as are a good table of contents, an index, and a glossary.

Is Jack Easy?

As with many products designed to perform useful tasks for businesses, Jack's ease of use depends heavily on users' understanding of some basic concepts. You have to understand concepts such as *file, record, field,* and *merging of files* before Jack will seem easy.

Following the tutorial is simple, and there is a good chance that those who take the time (in our case about four hours) to go through it will greatly improve their understanding of these important concepts.

There is no guarantee that beginning users of Jack can avoid frustration altogether. Until you understand the various menu options, you may spend more time in the Error Message Appendix than you would like, although the error messages are easy to understand.

There is no guarantee that beginning users of Jack can avoid frustration altogether.

To help ease the learning process, Jack offers a hot line. When we called, we talked to someone who really knew the product and easily helped us through a frustrating moment. The company has a standard $30 charge for this service, but it may be worth the price for beginning computer users.

Jack Is

Jack is not a complete spreadsheet, but you can use it for calculations and simple what . . . if computational analyses. Jack is not a sophisticated word processor, but you can use it for letters and memos. The program is especially handy if such documents must include calculations or information merged from other files. Jack's manufacturer does not claim that this product is a data base, but for our money it would be worth the price if that's all it was.

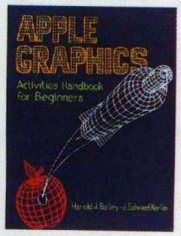
Certainly The Incredible Jack does a credible job of imitating integrated packages that run on larger systems. If you just bought an Apple IIe and are wondering which single piece of software to buy in order to make it start paying for itself, take a look at this product. ✚

Brady Books are right on target

The Brady Company, A Division of Prentice-Hall, has hit the mark with the best books written for the Apple computer. We have assembled the authors to give you the information you need to get the most out of the machine. You will benefit from their years of experience in working with the computer in many enjoyable, readable titles.

And, The Brady Co. is right on target by publishing books for the beginner and the advanced Apple user. Among the long list of titles from which you may choose are:

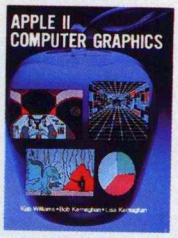
"Apple Graphics: Activities Handbook"
By Harold J. Bailey and J. Edward Kerlin



This book takes a hands-on approach to learning both low and high resolution graphics for Apple II and Apple IIe. Step-by-step with the accompanying diskette, you'll learn by doing. With the many activities it contains, you can expand your knowledge and use graphics to benefit your home and your business.

1983/300pp/paper/ISBN 0-89303-308-1/ D3081-9/$15.95
With Diskette: 1983/ISBN 0-89303-309-1/ D3091-5/$34.95

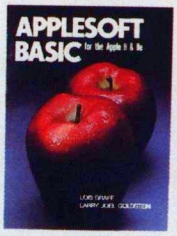
"Apple II/IIe Computer Graphics"
Ken Williams, Bob Kernaghan, Lisa Kernaghan



With a working knowledge of BASIC programming, your fingers are the keys to the most current graphics techniques. Written by Ken Williams, the president and founder of Sierra On-Line Inc., this excellent guide, offers a complete explanation of Apple II and IIe graphics. It explores the range of graphic possibilities from the simple to the complex. Placing dots on the screen, artificial color generation, animation and the sophisticated byte-move techniques, can all be done without assembler or machine language experience.

1983/225pp/paper/ISBN 0-89303-315-4/ D3154-4/$19.95

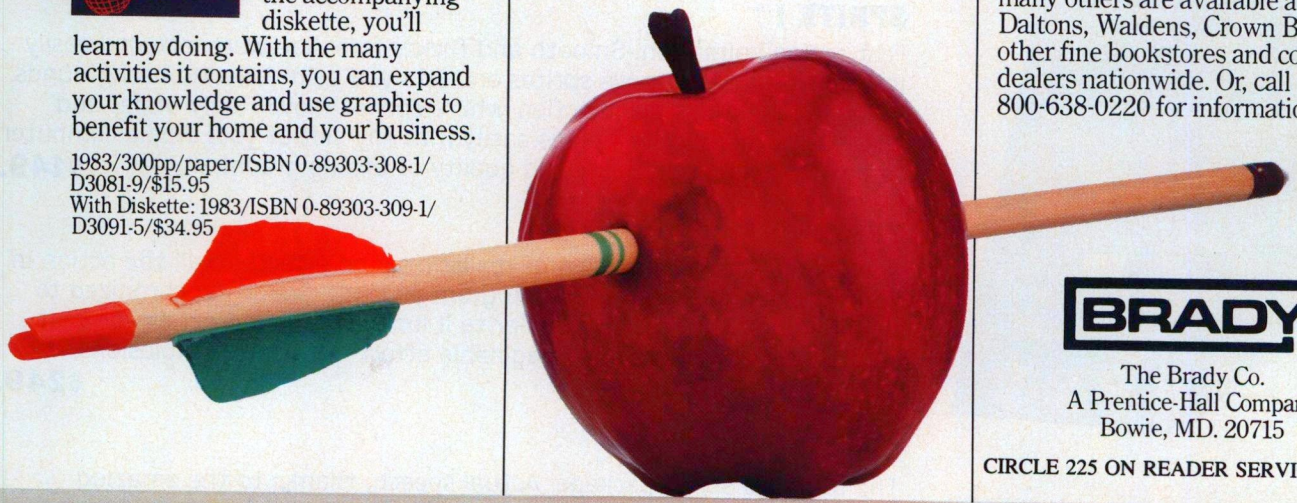
"Applesoft BASIC for the Apple II/IIe"
Lois Graff and Larry Joel Goldstein



This book is the one you've been looking for to learn the fundamentals of BASIC programming for the Apple II and IIe. Both practical and easy to follow, it discusses the special features found only in the new Apple IIe. "Applesoft BASIC" guides you through the simplest of programming knowledge to the more complex capabilities. This invaluable asset to your library includes chapters on structured programming, sequential and random file usage, graphics, music and error-handling.

1983/320pp/paper/ISBN 0-89303-320-0/ 03200-5/$17.95

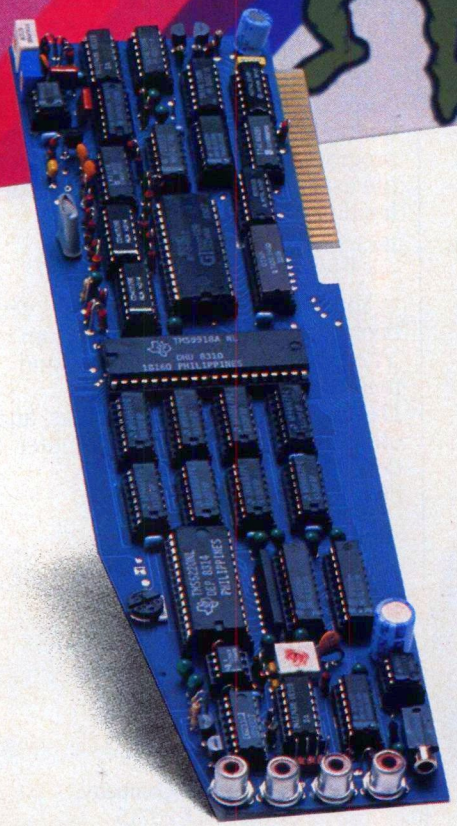
You, too, will be right on target with books for you and your Apple from The Brady Co. Those featured and many others are available at B. Daltons, Waldens, Crown Books, and other fine bookstores and computer dealers nationwide. Or, call 800-638-0220 for information.



BRADY

The Brady Co.
A Prentice-Hall Company,
Bowie, MD. 20715

CIRCLE 225 ON READER SERVICE CARD



Sprite Graphics
for Apple™ Computers

3 exciting ways to enter a new galaxy of action and adventure

SPRITE I™

Fast action animation. Smooth and flicker-free. Software included easily lets you create and move sprites and lets you paint colorful backgrounds. Enjoy unique multi-plane action where sprites move freely under and over each other. Sprite I plugs easily into any slot of your Apple computer to give you the excitement and quality of arcade graphics. **$149.**

SPRITE II™

Add the dramatic dimension of realistic sound effects to all the action in Sprite I. Sound you can easily program yourself. Sound synchronized to the action on the screen. The Sprite II includes a sound generator that lets you create almost any imaginable effect—gunshots, explosions, music, the roar of an engine. **$249.**

SUPERSPRITE™

The ultimate sprite package. Actual speech, thanks to the amazing ECHO II™ speech synthesizer. The ability to simultaneously join sprite graphics and Apple programs together on the screen. The STARSPRITE I™ diskette featuring the new Ampersprite language for creating and moving sprites, painting background scenes and programming sound effects. Yes, SuperSprite has it all. Sprites, sound, speech, software. **$395.**

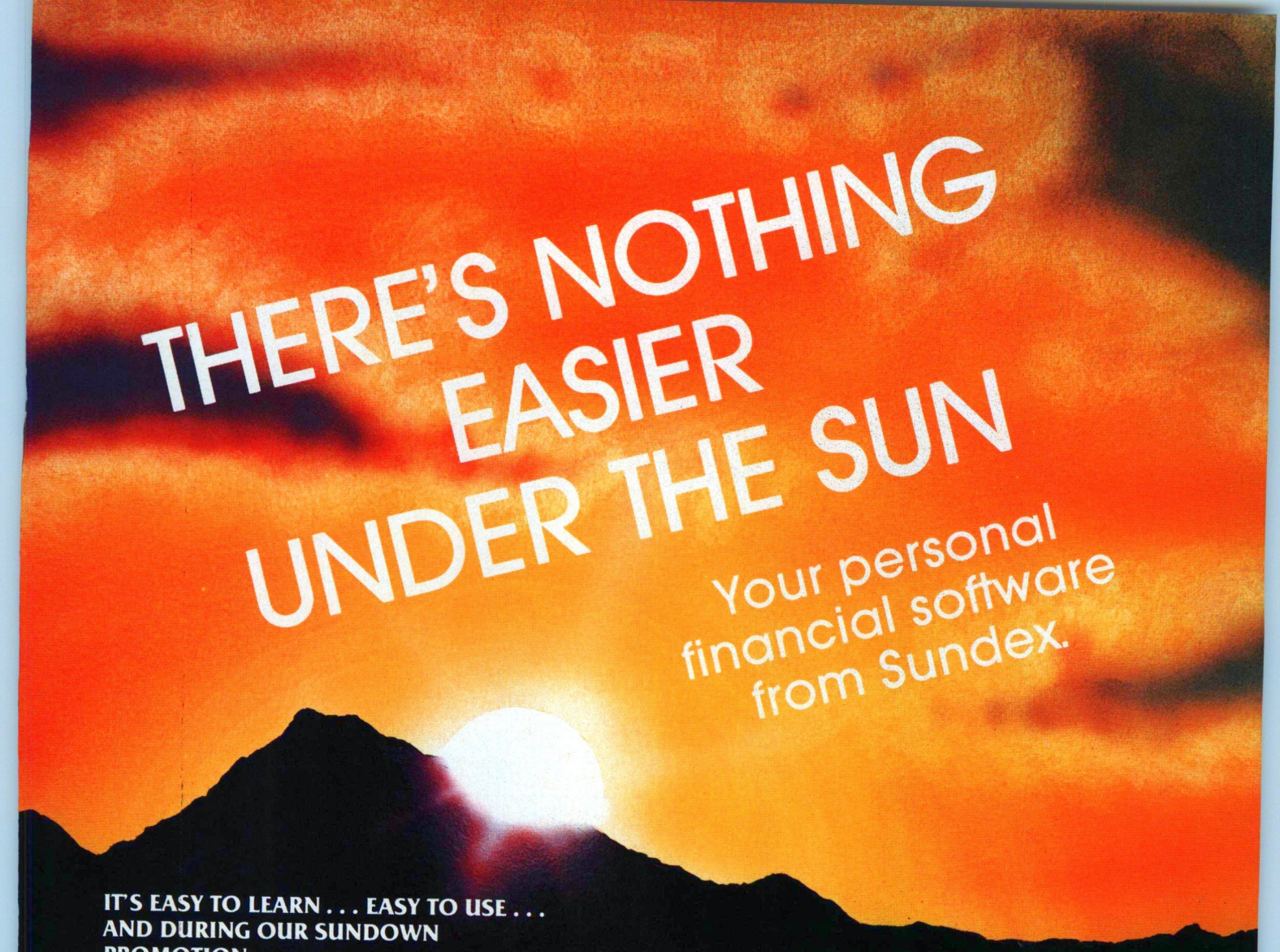
Call 800-426-7412 for your nearest dealer.

Synetix Inc.

10635 N.E. 38th Place
Kirkland, WA 98033
(206) 828-4884

CIRCLE 105 ON READER SERVICE CARD

™Apple is a registered trademark of Apple Computer, Inc.
™SuperSprite is a registered trademark of Synetix, Inc., 1983
™Starsprite I is a registered trademark of Avant-Garde Creations, Inc.
™Echo II is a registered trademark of Street Electronics Corp.



IT'S EASY TO LEARN . . . EASY TO USE . . . AND DURING OUR SUNDOWN PROMOTION . . . INCREDIBLY EASY TO BUY!!

Get the satisfaction and fun of keeping money matters under control whether your interest is in the stock market, tax management or everything in between. Not only do special promotional prices make Sundex Software an EXCEPTIONAL VALUE but "on-screen" instructions, a "HELP" key, and a manual written in "plain English," make these programs EASY-TO-USE BY ANYONE.

Sundex programs can work alone or together to help you organize and manage your money:

CERTIFIED PERSONAL ACCOUNTANT™ – You're in control of your finances with the program that puts your financial status at your fingertips. Easily organize, analyze and manage your finances effectively. It even pays bills automatically!

CERTIFIED PERSONAL INVESTOR™ – Enjoy the ease and security of managing your investment portfolio on this program. It's designed for personal portfolio management, analysis, and tax form preparation.

PERSONAL PAYABLES™ – Have fun with the Sundex program that automatically pays all your bills from up to 10 different checking accounts and prints out your checks.

These programs are available for the Apple II and IIe, IBM PC and PC jr, and the TI Professional.

The Sundex special prices last until February 5th. But, don't wait to buy. The prices go up every two weeks, so THE SOONER YOU BUY THE LESS YOU PAY. Ask your dealer to let you try this remarkable software. Then look for the colorful "Sundex Sundown" display to get this week's price on the programs you want for you and your family.

But hurry . . . you can still
SAVE UP TO 25%
if you act now.

Call 1-800-835-3243 today for the name of the Sundex dealer nearest you.
THERE'S NOTHING EASIER UNDER THE SUN.

Sundex

SUNDEX SOFTWARE CORPORATION
3000 Pearl Street
Boulder, Colorado 80301
303-440-3600

CIRCLE 234 ON READER SERVICE CARD

▶HARDWARE REVIEW/BY HANK HARRISON

ULTRAT

This video-graphics add-in card lets you make the most of your high-resolution monitor.

Videx Ultraterm
Videx Corporation
Corvallis, OR 97330
List Price: $395

The Videx Ultraterm is a multimode video-graphics add-in card for the Apple II, II Plus, IIe, and III computers. This card takes the place of a typical 80-column board but does much more. It offers two distinct alphanumeric character sets and two graphics-generator character sets. It lets you operate in nine screen modes, allowing 80- , 132- , and up to 160-column operation with several screen line settings, for high-resolution monitors.

The Ultraterm has many software options and supports all prior Videx software. The display modes or screen formats selectable under software control for the Ultraterm include 160 columns by 24 lines, 132 columns by 24 lines, 128 columns by 32 lines, 96 columns by 24 lines, and a few others.

Two 80-column-mode settings are available. The default setting is identical to that of the earlier Videx Videoterm 80-column board, while the new 80 × 24 setting adds the high-resolution interlaced character set.

Finally, the Ultraterm allows the system to operate in the standard Apple 40-column mode without your having to change boards, which will prove handy for playing games designed for 40 columns or for using other 40-column software. This product lets you accommodate many video motifs under software control with a single board.

Theory of Operation

You don't have to understand board-level technology to install or use the Ultraterm. If you are planning to purchase an 80-column board and would also like a handsome character set, simply plug the Ultraterm into slot number 3 and connect two wires.

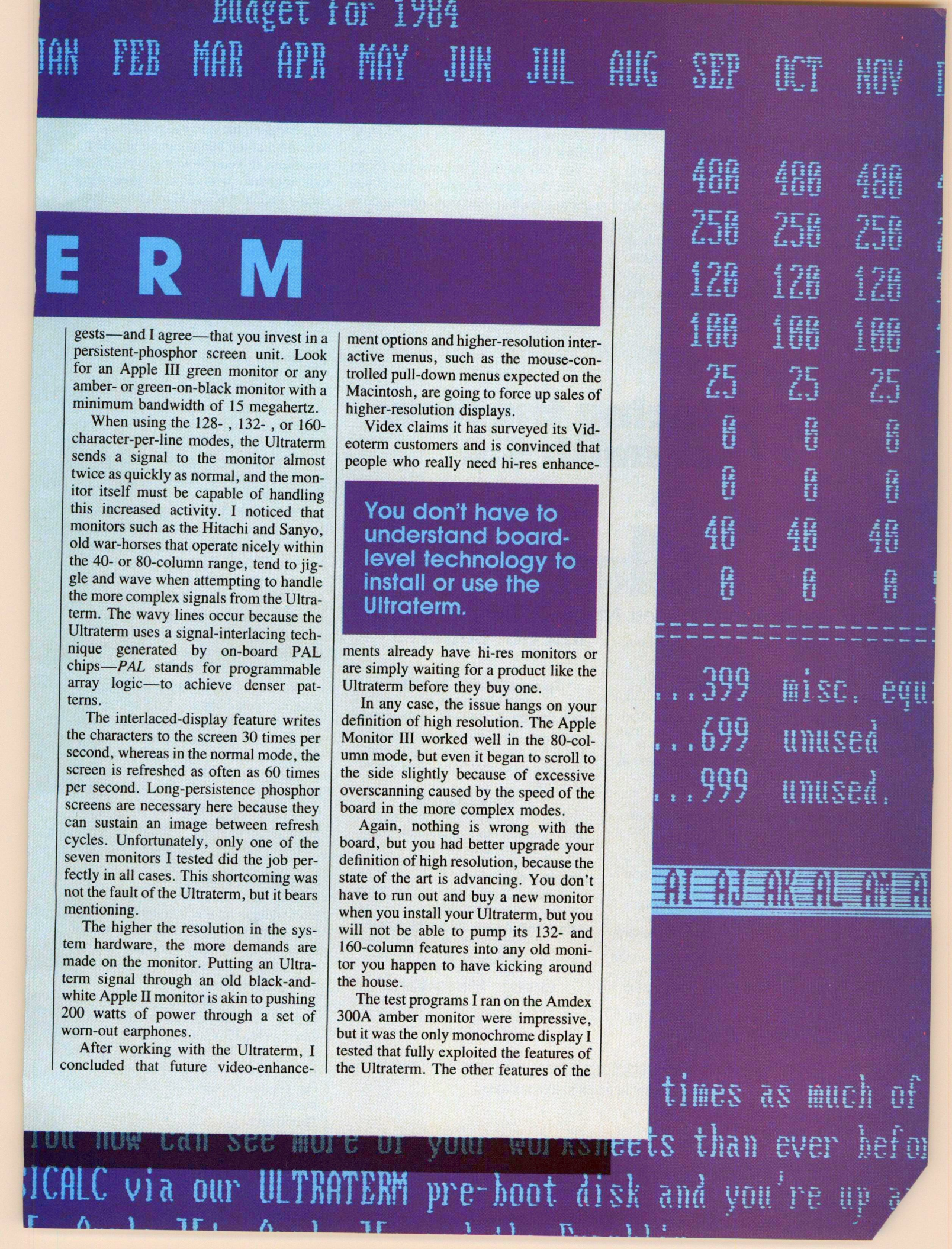
You need not be a programmer to use the Ultraterm, but to take maximum advantage of the card, you must at least read the manual, which is unfortunately flawed, and memorize a few tricky words, all neatly defined in an easy-to-comprehend glossary.

You should also have a clear idea of your needs. Do you want to do word processing, graphics, game development or spreadsheet display, or will you be switching from one application to the next, two or three times each day?

Testing the Ultraterm has shown me that the days of low-resolution CRTs are numbered.

Monitor Requirements

Testing the Ultraterm has shown me that the days of low-resolution CRTs are numbered. If you really want your Ultraterm to "fly," the manufacturer sug-



E R M

gests—and I agree—that you invest in a persistent-phosphor screen unit. Look for an Apple III green monitor or any amber- or green-on-black monitor with a minimum bandwidth of 15 megahertz.

When using the 128- , 132- , or 160-character-per-line modes, the Ultraterm sends a signal to the monitor almost twice as quickly as normal, and the monitor itself must be capable of handling this increased activity. I noticed that monitors such as the Hitachi and Sanyo, old war-horses that operate nicely within the 40- or 80-column range, tend to jiggle and wave when attempting to handle the more complex signals from the Ultraterm. The wavy lines occur because the Ultraterm uses a signal-interlacing technique generated by on-board PAL chips—*PAL* stands for programmable array logic—to achieve denser patterns.

The interlaced-display feature writes the characters to the screen 30 times per second, whereas in the normal mode, the screen is refreshed as often as 60 times per second. Long-persistence phosphor screens are necessary here because they can sustain an image between refresh cycles. Unfortunately, only one of the seven monitors I tested did the job perfectly in all cases. This shortcoming was not the fault of the Ultraterm, but it bears mentioning.

The higher the resolution in the system hardware, the more demands are made on the monitor. Putting an Ultraterm signal through an old black-and-white Apple II monitor is akin to pushing 200 watts of power through a set of worn-out earphones.

After working with the Ultraterm, I concluded that future video-enhancement options and higher-resolution interactive menus, such as the mouse-controlled pull-down menus expected on the Macintosh, are going to force up sales of higher-resolution displays.

Videx claims it has surveyed its Videoterm customers and is convinced that people who really need hi-res enhancements already have hi-res monitors or are simply waiting for a product like the Ultraterm before they buy one.

You don't have to understand board-level technology to install or use the Ultraterm.

In any case, the issue hangs on your definition of high resolution. The Apple Monitor III worked well in the 80-column mode, but even it began to scroll to the side slightly because of excessive overscanning caused by the speed of the board in the more complex modes.

Again, nothing is wrong with the board, but you had better upgrade your definition of high resolution, because the state of the art is advancing. You don't have to run out and buy a new monitor when you install your Ultraterm, but you will not be able to pump its 132- and 160-column features into any old monitor you happen to have kicking around the house.

The test programs I ran on the Amdex 300A amber monitor were impressive, but it was the only monochrome display I tested that fully exploited the features of the Ultraterm. The other features of the

board, such as reverse video, the alternative character sets, the graphic-design provisions, and the brightness-control settings, are of great value and represent worthwhile improvements over normal 80-column boards.

I must also add here that the 160-column mode is not practical on a small screen, regardless of resolution, because the human eye is not designed to look at anything that small for any length of time. Still, I can imagine applications for this degree of character density, especially in the preparation of lecture slides, school presentations, or any material that will eventually be projected on a large screen, and in industrial applications in which characters take a back seat to graphics.

Setting Up

You can set the Ultraterm and forget it in the default configuration, but if you want to switch around from one mode to the next, you will have to develop a few minor keyboard skills. Notice that I did not say *programming skills*. Operating a computer is not programming, but you'll need keyboard skills beyond touch-typing in this situation.

The two most popular and obvious uses for the Ultraterm will be word processing and spreadsheet display. Let us then focus on these two aspects, bearing in mind that the board can be appealing as a menu-driven software-development tool together with a code-generating toolkit such as ORCA-M and as a graphics-terminal emulator.

Word Processing

The Ultraterm character sets enhance readability for any word-processing software. The characters in the 80 × 48 mode are similar to Times Roman Bold—they are full-serif and well proportioned. They also print out well on any printer that can handle graphics code.

Apple Writer

If you plan to use the Ultraterm with Apple Writer, you must purchase an additional Apple Writer preboot software diskette. It will allow you to use an extended memory card on the IIe, giving you up to 128K of RAM.

PIE Writer

Presumably Videx is trying to encourage as many software vendors as possible to support this specialized piece of hardware. Although the preboot diskettes available from Videx for VisiCalc and Apple Writer are available as options, I recently saw an enhanced version of PIE Writer already configured for the Ultraterm, at no extra cost.

WordStar

WordStar comes with a configuration program called Install. You will need to reinstall your WordStar diskettes to configure them for the Ultraterm, which should present no problem, assuming the Ultraterm is in slot 3. WordStar was designed with an 80-column board in mind, and the only tricky area, which has to do with uppercase and lowercase toggles, is covered in the Videx manual.

Spreadsheet Displays

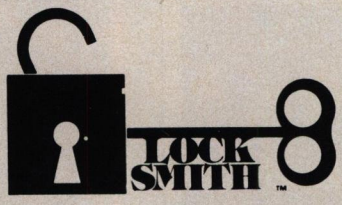
Although wider spreadsheet formats are available on the Ultraterm, the 128-column by 32-line mode is the most suitable. You can easily configure this setting with a special, but optional, VisiCalc preboot diskette.

The demonstration diskette that comes with the Ultraterm displays an entire year, 12 VisiCalc columns on one screen. This layout represents a marked improvement over the sideways scrolling typical of most 40-column spreadsheets.

Hardware

The Ultraterm offers many hardware features at the chip level. The board has a typical Schottky design throughout,

Introducing the New Locksmith 5.0™



The World's Finest Nibble-Copier for Apple®
Protected Software **Just Got Better!**

When you invest in software that's vital to your everyday usage you can't afford to be without a backup. And nobody can do it better for you than Locksmith. (Our earlier model 4.0 was recently rated by Apple users as their 3rd most favorite software program.)

Locksmith 5.0 backs up virtually all the latest Apple disks—even those with the most recent protection devices. And, thanks to the new interactive "conversational" program language, you can upgrade this Locksmith to decipher new protection devices as they appear. You keep Locksmith 5.0 **state-of-the-art!**

You also get all the utilities that made Locksmith so popular...and more.
• Media Surface Check • Disk-drive Speed Calibration • Degauss and Erase • Nibble-Editor • Quickscan • plus many others.

Special Trade-In Offer for Owners of Locksmith 3. and 4. Programs

Upgrade your current Locksmith to 5.0 at a substantial savings over the purchase of a new 5.0. Call or write for details.

A New Manual

Clear and easy-to-understand, this newly written manual will take you step-by-step through all the Locksmith options. Instructions are precise and detailed.

Locksmith 5.0 only $99.95 plus $3.50 for shipping and handling.

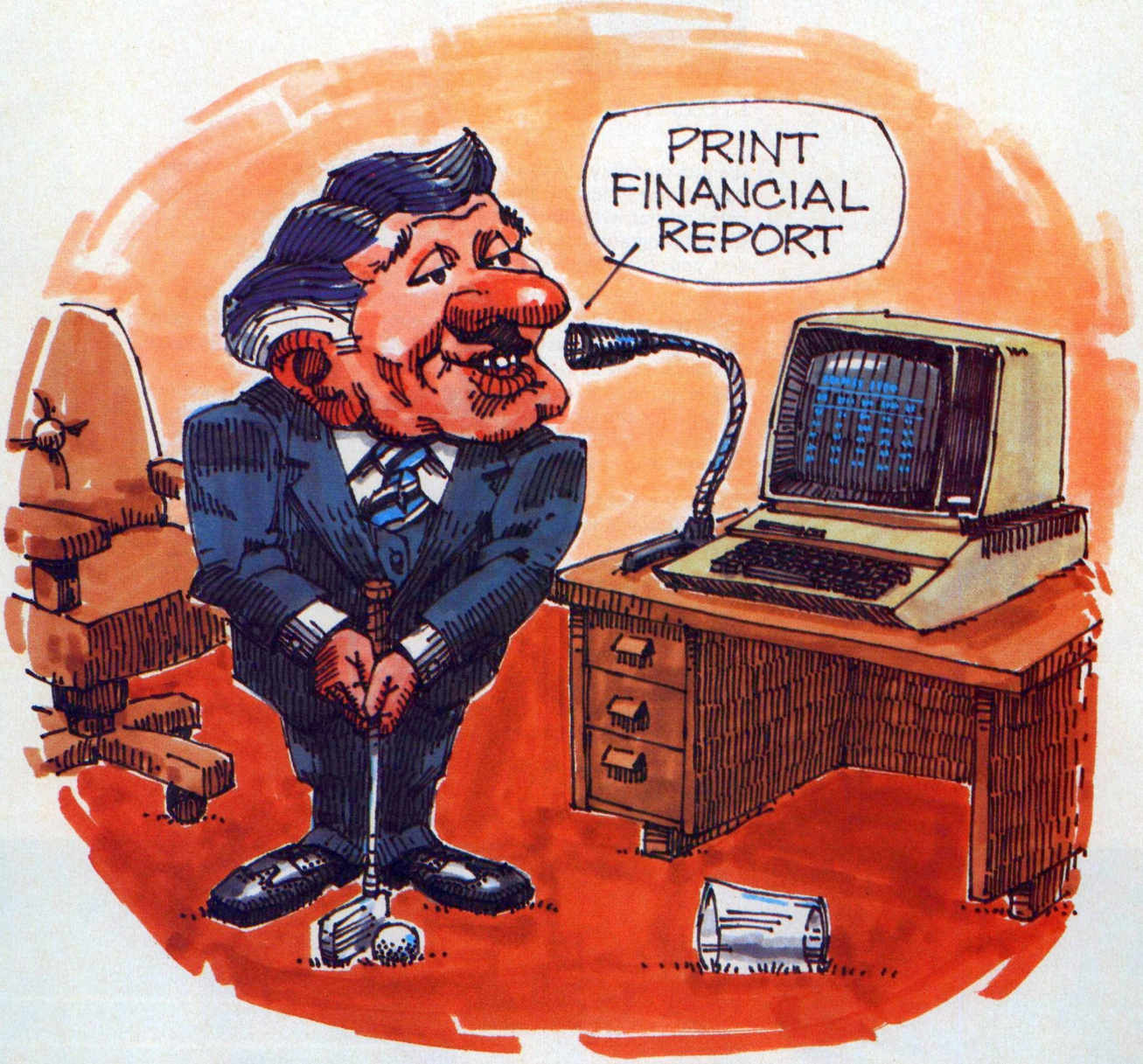
Call Toll-free 1-800-835-2246
(In Kansas 1-800-362-2421)

Omega MicroWare
222 S. Riverside Plaza
Chicago, IL 60606
(312) 648-4844

Locksmith and Omega MicroWare are trademarks of Omega Microware, Inc. Apple is a registered trademark of Apple Computer, Inc.
©1983 Omega MicroWare, Inc.

CIRCLE 149 ON READER SERVICE CARD

Look, Ma, no hands!



If you don't type, you've probably longed for the day when you could simply talk to your computer. It's here.

Your voice can set you free.
With the Voice Input Module from VMC, you can "train" your Apple II, IIe,® or Franklin® to perform as many as 80 different spoken commands, in unlimited subsets, with near-perfect recognition.

So where you used to type "/P return — " ∧ CO return N39 return" you can just **say** "print."

Command performance.
The Voice Input Module works parallel to the keyboard with all existing applications software. So you can type if you need to, or do anything from electronic spread sheets to word processing to games with voice control alone. Either way, you'll increase your productivity and have fun doing it.

Demand a demonstration.
You won't believe it until you see it. So see the Voice Input Module at your nearby computer store today.

And find out how little you'll miss typing.

Apple II and IIe are registered trademarks of Apple Computer, Inc. ■ Franklin is a registered trademark of Franklin Computer, Inc.

VIM **YOUR VOICE CAN SET YOU FREE.**

VOICE MACHINE COMMUNICATIONS

1000 South Grand Avenue ■ Santa Ana, California 92705 ■ Telephone (714) 541-0454 for the dealer nearest you.

CIRCLE 138 ON READER SERVICE CARD

Instant one-button color printing.

Press here.

It's just that easy! Any time you want to print what's on your Apple's screen just hit the copy button on your Transtar 315 color printer with our PICS card installed, and it's done! No special programming, no lengthy code sequences, no need to exit your program! Just press the button and it prints!

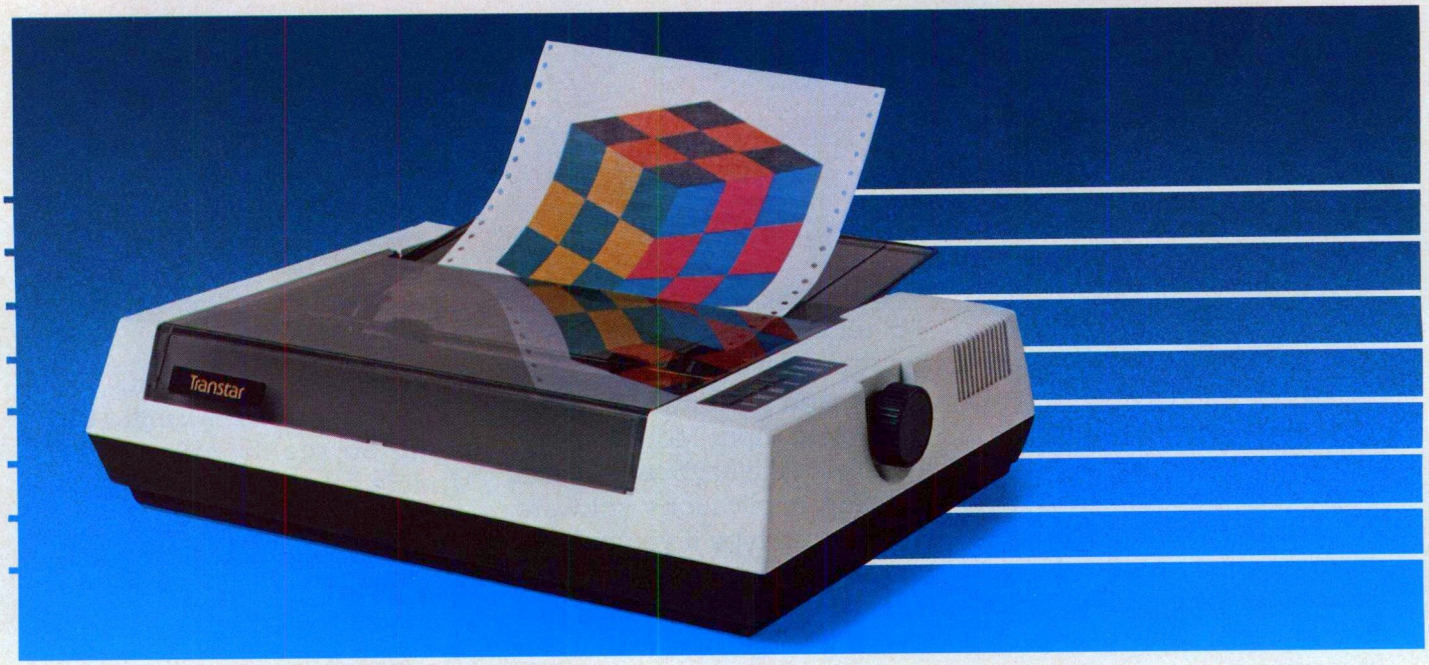
By adding the optional PICS card to your $599 Transtar 315 color printer, you've opened up a whole new world of easy color printing. For the first time ever, our PICS parallel interface card enables you to screendump virtually any program -- graphics, charts, games -- even copy-protected software! Specially designed only for the Apple II, II+, IIe, and Franklin computers, the Transtar 315 PICS card does the work of a parallel card and a lot more and costs only $119.95.

At the push of a button, Transtar's innovative new 4-color diagonal ribbon will print up to 7 colors and more than 30 shades in a single pass.

The 315 is precision-built to exacting standards by Seikosha, the most experienced company of the famous Seiko group--recognized worldwide for quality and dependability. In fact, one of the nicest things about Transtar's 6-month warranty on parts and labor is that you'll probably never use it!

Innovative, inexpensive, dependable, easy: the Transtar 315. Color printing has never looked so good!

Only $599.



*PICS cards are currently available for Apples and Franklins. PICS cards for other computers will be available in the future.

Transtar
A Vivitar. Computer Product

P.O. Box C-96975, Bellevue, WA 98009

CIRCLE 143 ON READER SERVICE CARD

albeit very densely packed. The only new technology shows up in the PAL chips. These little devils give board designers exact logic states where required, so that they can pack more logic into a smaller space.

The Ultraterm uses 4K of on-board RAM—2K is typical—which allows faster processing of the I/O functions from the CRTC (cathode-ray-tube controller) chip located at the heart of the board.

The CRTC is actually a specially programmed microprocessor that continually converts the character information in the display into video signals, which, in turn, drive the display monitor, much like a distributor in a car.

Firmware

The Ultraterm also operates with an advanced character-set EPROM (erasable, programmable read-only memory), generically thought of as firmware, on board. This circuit stores, in one or two chips, all of the information necessary to generate dot matrices that represent particular characters. The Ultraterm signal transmits a resolution equivalent to that of an 8 × 12-dot matrix on a printer, which is a 40% improvement over standard video I/O products.

The EPROM also lets you set up certain graphics and international symbols and uses true descenders on letters such as *y* and *g*. The symbols for the lira, yen, mark, franc, and pound are included, as are all of the international accents, diacritical marks, the umlaut, and the tilde.

The Ultraterm firmware allows compatibility with Apple DOS, Pascal, both Applesoft BASIC and Integer BASIC, the Softech P-System, and CP/M with the Zilog Z80 card. You can transfer the escape sequences and other control keystrokes directly from the Videx 80-column board. In other words, you won't need any new terminology or skills to operate this product in its standard configuration.

Graphics

The character-set font of the Ultraterm is a major advancement for Apple users. The Ultraterm firmware also includes a 15-character line-drawing set, and a seven-module block-drawing set. These two sets, used properly, enable an experienced programmer to develop amazingly crisp screen images and menus.

I have seen this specialized graphics character set before. It comes standard on the Victor 9000 computer, which is designed around a very-high-resolution screen. I hadn't seen such a building-block approach available for Apple computers in EPROM on a video board, though.

The old technique for creating a menu mask was to build up screen graphics from the asterisk, period, hyphen, the letter *X*, the letter *O*, and the + symbol, because these came in the standard ASCII character set. Now you can use both graphics blocks and graphics lines as well as characters.

Conclusions

The Ultraterm board is the most advanced add-in video-enhancement product I have seen for the Apple II and III family to date. In order to penetrate its deeper mysteries, you may have to master certain technical terms, but generally it is an easy device to use.

No high-resolution EPROM chip can produce valid outputs quickly enough to be useful during a single video-refresh cycle. For this reason, all In/Out signals on the Ultraterm are stored and delayed in a string buffer, or "pipeline," until the CRTC chip and the keyboard request them.

In order to penetrate its deeper mysteries, you may have to master certain technical terms.

The CRTC then handles the signals intelligently and conforms them to custom settings through a DIP switch and software. Most boards are not programmable in this manner.

Generally, the Ultraterm is a product worthy of respect. It is ahead of its time and is ideal for the more advanced monitors that will soon be available. I can even recommend it for improving and stabilizing low-resolution displays.

One sour note: The manual is one of those outwardly beautiful but inwardly awkward things, written by programmers with a certain lack of concern for the average citizen. It suffers from syntax errors and inconsistencies throughout, and it is poorly organized. On the other hand, it is complete, and with a little study you will be able to scrape together all the information you need.

A standard 80-column board may be adequate, but if you're planning to purchase, or already own, a high-resolution monitor, you can't go wrong if you investigate the Ultraterm. ✚

EDUCATIONAL SOFTWARE ON SPECIAL

$1.00 credit for phone orders over $100.00

EDUCATIONAL (OUR SPECIALTY)

	LIST	SPECIAL
• C.A.I.		
The Game Show	39.95	28.56
Mastermatch	39.95	28.56
• Control Data (Plato)		
Basic Number Facts	49.95	35.96
Spanish Vocabulary Builder	49.95	35.96
• Davidson		
Math Blaster!	49.95	35.96
Word Attack!	49.95	35.96
Speed Reader II	69.96	49.76
• E.M.E.		
Intro. Genetics	47.00	33.78
Mirrors + Lenses	30.00	21.86
• Eduware		
Algebra 1, 2, 3, or 4	39.95	28.56
Hands on Basic	79.00	56.46
• Learning Company		
Moptown Hotel	39.95	28.56
Rocky's Boots	49.95	35.96
• Milton Bradley		
All About Commas	39.95	28.56
All About Division	39.95	28.56
• P.D.I.		
New Step by Step	89.95	64.56
Step by Step II	89.95	64.56
• Spinnaker		
Alphabet Zoo	29.95	21.86
Delta Drawing	49.95	35.96
Story Machine	34.95	24.86
• Xerox		
S'Bear ABC'S	39.95	28.56
S'Bear Numbers	39.95	28.56
S'Bear Shapes	39.95	28.56
• Miscellaneous		
Bank Street Writer	69.95	49.96
Creature Creator	39.95	28.56
Crossword Magic 2.0	49.95	35.96
Early Games	29.95	21.86
Logo (Krell)	89.95	75.46
Master Type	39.95	28.56
SAT (Harcourt Brace)	79.95	57.86
SAT (Krell)	299.95	252.96

Ask for FREE price list

Educators: ask for special educational catalog

HARDWARE

Alaska Card	129.95	107.19
Koala Pad	124.95	90.46
Mockingboard	179.00	140.19
Gibson Light Pen	349.00	251.26
Replay II	130.00	107.19

OTHER

Bookends	124.95	90.46
BurgerTime	34.95	23.46
Enchanter	49.95	35.46
Ess. Data Dup. (EDD)	79.95	58.16
Think Tank	150.00	108.96
Word Handler	59.95	42.86

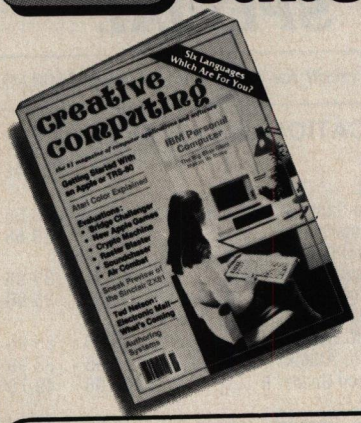
BYTES & PIECES

C.O.D. • M.O. • Cert. Checks • School P.O. • VISA • MasterCard • Checks Allow 2 Weeks • N.Y.S. Res. Add Sales Tax • US Orders Under $150. Add $2.00 P & H • All Canadian, US Funds $3.00 P & H. Foreign, Charges Only, Min. P & H $6.00

Box 525, Dept. B
East Setauket, N.Y. 11733
(516) 751-2535

CIRCLE 116 ON READER SERVICE CARD

7 Good reasons why you should subscribe to *Creative Computing*.



It's the Number One magazine of computer applications and software!

There's one place you can always be sure of learning more about microcomputer software and applications: *Creative Computing*.

Every month *Creative Computing* provides you with a continuing education on everything related to microcomputers and computer equipment. Useful articles, "how to" tutorials, exciting new applications, games and "no holds barred" reviews of the latest software and equipment make up a major part of *Creative Computing*'s editorial content.

We give you probing features on programming breakthroughs and important news. Plus in-depth articles on elementary, intermediate and advanced software and applications topics—to help you develop your knowledge and skills, save hundreds (perhaps thousands) of dollars in unneeded software, discover uses for your personal computer that you might never have considered. Articles that increase your overall "computer consciousness." Here's how:

1 *Creative Computing* gives you things to actually do with a computer.

Just owning a computer isn't enough. You've got to know what to do with it. That's why applications are our primary focus. Text editing, animation, graphics, business simulations, data base and file systems, music synthesis, control of household devices, communications, games—some of the applications and software you'll learn about in *Creative Computing*.

2 *Creative Computing* discusses business applications in simple, nontechnical language.

If you're a business person who needs to know about the latest developments in word processing and office applications, turn to *Creative Computing*. We clarify such business applications as investment analysis, futures evaluations, data base management, mailing list programs, text editing, word processing and simulations. And all the software available for business people.

3 *Creative Computing* helps you decide which computer equipment is best for you.

Our tough, no-nonsense equipment profiles arm you with the facts before you walk into a computer store. You'll know the right questions to ask and how to cut through the jargon and sales hype. We give you authoritative guidance in deciding what you need, what you don't need—and what's right for you and your pocketbook.

4 *Creative Computing* covers computer education in depth.

We started out as a computer education publication, and we're still committed to the educational community. We regularly carry articles on designing educational software, evaluating educational software, teaching concepts and terminology in computer education, text editing applications for literature and computer simulations in the classroom—plus a great deal more.

5 *Creative Computing* brings you hours of mind-expanding game entertainment.

We've got a soft spot for the computer game addict—and computer game software. We know you want to understand more about the new computer games flooding the market: which ones are easiest to learn? Require the most skill? Offer the most surprises? Give you the best graphics? Provide the most challenge? Contain a new twist? *Creative Computing* brings you the answers.

6 *Creative Computing* features the state of the art.

Columns on the most popular personal computers, a "software legal forum," letters to the editor. Reviews of books, games, organizations, dealers and events. Fascinating interviews with leading innovators, equipment designers, program developers and game inventors—men and women who'll give you a real glimpse of the future!

7 Our price is right.

By subscribing to *Creative Computing* now, you can save as much as 33% off the full subscription price. To learn elsewhere what you'll learn from *Creative Computing*, you might spend hundreds of dollars in course fees and books. Then you'd have to winnow out what you could use from all that you'd learned. But *Creative Computing* does that for you, so you'll have time to enjoy your own computing interests. And that saving of time makes this offer very inexpensive indeed.

Join over 150,000 *Creative Computing* readers by subscribing today! Just use the coupon at right.

SAVE UP TO 33%!

Creative Computing · P.O. Box 5214 · Boulder, Colorado 80322

YES! Send me *Creative Computing* for:

- ☐ One year (12 issues) for $19.97—I save 20%!
- ☐ Two years (24 issues) for $36.97—I save 26%!
- ☐ Three years (36 issues) for $49.97—I save 33%!

Savings based on full one-year subscription price of $24.97.

Check one: ☐ Payment enclosed. ☐ Bill me later. 8H153

Mr. / Mrs. / Ms. _____
(please print full name)

Address _____ Apt. _____

City _____

State _____ Zip _____

Offer valid in U.S. and possessions only. Please allow 30 to 60 days for delivery of first issue.

MAKING HI-RES CHARACTERS

PART II

Part II in a tutorial on making the most of Apple color graphics.

The versatility of high-resolution graphics has always been one of the Apple computer's most attractive features. Last month we covered, in part, the use of HPLOTs to draw pictures and mathematical functions, enlarge figures, and move simple shapes. This month we'll look at a more advanced way of manipulating hi-res figures by using shape tables.

A shape *definition* consists of a series of hexadecimal codes that defines one or more desired graphic figures. A shape *table* is simply a shape definition that includes some other essential look-up information. After you've constructed a shape table once, you'll find it's much easier to do than it will seem on first reading.

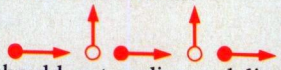
The versatility of high-resolution graphics has always been one of the Apple computer's most attractive features.

First, sketch a shape on graph paper, using each box to represent one pixel. We'll start with a 5 × 5-pixel square, since that's a simple shape to draw. Later we'll get to more complex figures such as a man who throws spinning hatchets at a target. (No fair, peeking ahead!)

The first thing you must decide is where you want to locate the starting point of your shape. The computer draws the picture so quickly that you can't see where the square begins or ends, but the computer needs to know the starting coordinates, nonetheless. Your starting point need not be an actual part of your drawing; it's there to serve as a reference. I've chosen to begin in the empty box in the center, so we can spin the square around it later (see figure 1).

When using shape tables, you must tell the computer to move up, down, left, and right (all 90° turns), and you must also specify whether you want the computer to plot (show) a point or just to move forward by one blank pixel.

We'll use arrows in our graph-paper plan to indicate the directions that we'll have to add to the outlined figure in figure 1. By convention, an arrow with a dot at the end indicates that the point is to be plotted, and an arrow with an open end point means that an unplotted move will be made. As we will see, on the screen itself we will not have to confine ourselves to shapes with only 90° turns; only our initial graph-paper plots require 90° moves. To convince yourself of this, draw a picture on your graph paper that matches these directions:



(You should get a diagonal line). Our square doesn't have any slanted lines, and should look like figure 2.

Now pretend that the arrows that make up figure 2 are drawn along a piece of string. If you "unwrap" this string (i.e., pull it out straight), it forms a sequence of vectors (implied moves) from start to finish, as in figure 3.

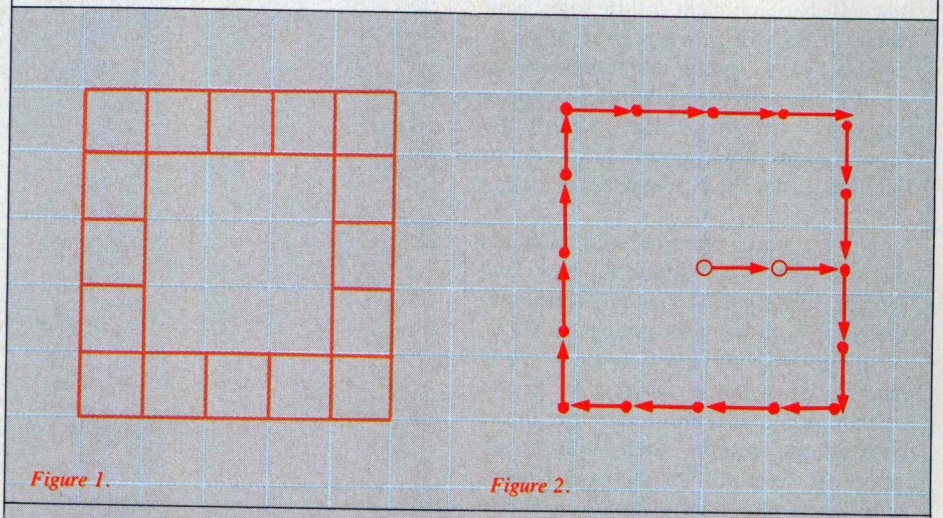


Figure 1.

Figure 2.

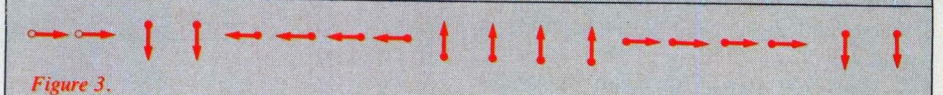


Figure 3.

Reviewing Your A,B,C's

You can make the sequence of plotting vectors we have just formed tell the Apple how to draw a square 5 × 5 pixels in size. The trick here is simply to get the computer to understand what we mean, for we can't just say "move right,"

"move right," "plot down," "plot down," and so on. The Apple stores shape-definition information in bytes within its memory. The bits within each of these bytes are grouped into three parts (see figure 4).

You will notice that parts A and B contain three bits, and C only has two. Bits 0 and 1, 3 and 4, and 6 and 7 will contain the codes that correspond to up, down, left, and right. Bits 2 and 5 specify whether a point is to be plotted or a blank move is to be made. Section C has no plot/move bit; as a permanent default, the Apple assigns move-without-plotting status to the two bits in C. For reasons that will become clear a little later, you cannot use C for moving *up*, either.

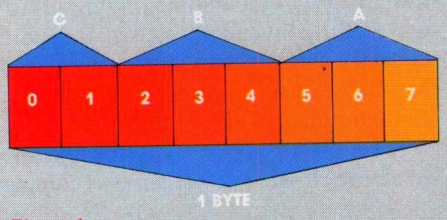


Figure 4.

0 move without plotting	00 up
1 plot	10 down
	01 right
	11 left

Figure 5.

Now we're going to translate our arrow picture (figure 3) into binary codes that will fit into the A, B, C pattern. To do so we must always work from right to left. The codes the Apple uses are in figure 5.

Next, set up a three-column table like the one shown in figure 6. Enter the arrows from figure 3, one at a time, into the chart, following the pattern A, B, C, A, B, C. Skip section C whenever you have an arrow *that either involves a plot or that indicates a move upward*. In the case of our square, there will be no arrows in C at all, for the only "move only" vectors we have are the first two steps, and these must go in sections A and B.

The next step is to insert the codes from figure 5. Our first move is a right vector that does not plot. A nonplotting move is signaled by a 0, and a right arrow by 01, so the first entry in A is 001. Since our next move is the same, we enter 001 in B, as well. The next vector in the sequence is one that plots and moves down, so its code is 110. This can't go in section C (which is why we skipped C when we were drawing the arrows in the last paragraph), so it must go into the next A section. At the same time, we can't leave our first A-B-C byte with only six bits specified, so we fill in C with a pair of 0's. This is a phantom "up" instruction that the Apple will ignore when it occurs in section C. Fill in the rest of the chart in a similar fashion.

This is a phantom 'up' instruction that the Apple will ignore.

Although our example section C will always contain two zeros, remember, in drawing other figures, that the vectors "down" (10), "right" (01), and "left" (11) are all perfectly legal codes for section C. If you arrive at C and need a "move up" (000) vector, put 00 in C (which will then be ignored) *and* enter the code into the following byte at A. If you happen to be drawing a shape that involves putting "up" moves in sections A and B of a byte, you'll *have* to make a move down or to the left or right in section C, or you'll end up with a byte whose codes read 00 000 000. That's the code the Apple interprets as the end of the shape definition!

Your filled-in sequence of binary codes for drawing the 5×5 square should match figure 6. Annoyingly, even though the computer itself operates only on such zeros and ones, we must

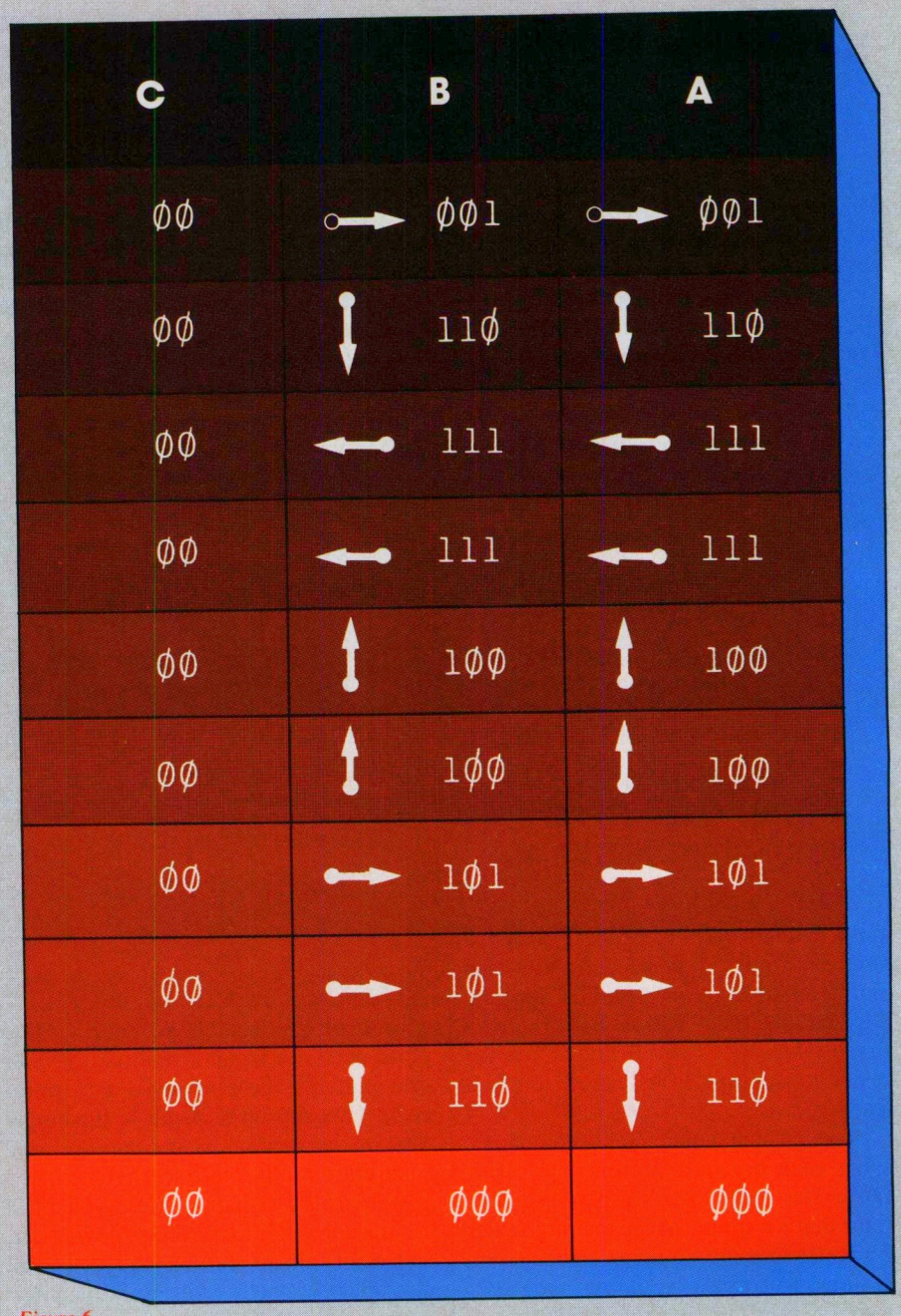


Figure 6.

convert these codes into hexadecimal representation in order to enter them through the keyboard. To do this, we ignore the A,B,C sections we've used previously and, instead, regroup the eight bits of each byte shown in figure 6 into two four-digit numbers (nibbles), as shown in figure 7.

You have to transform the two nibbles in each line in figure 7 into two hexadecimal digits. Just in case you don't find converting binary to hex one of the great thrills in life, the table in figure 8 will do it for you.

Using this information, we arrive at 09, 36, 3F, 3F, 24, 24, 2D, 2D, 36, 00 as the final code for our square. This may seem like a great deal of work just to draw a square (and we still have a little more to do), but you'll soon see that by using a shape table, you gain more control over the square than you do with the HPLOTs discussed in Part I of this tutorial. Once you understand this process, it's longer but no more complicated to draw more interesting shapes.

binary	hex
0000	0
0001	1
0010	2
0011	3
0100	4
0101	5
0110	6
0111	7
1000	8
1001	9
1010	A
1011	B
1100	C
1101	D
1110	E
1111	F

Figure 8.

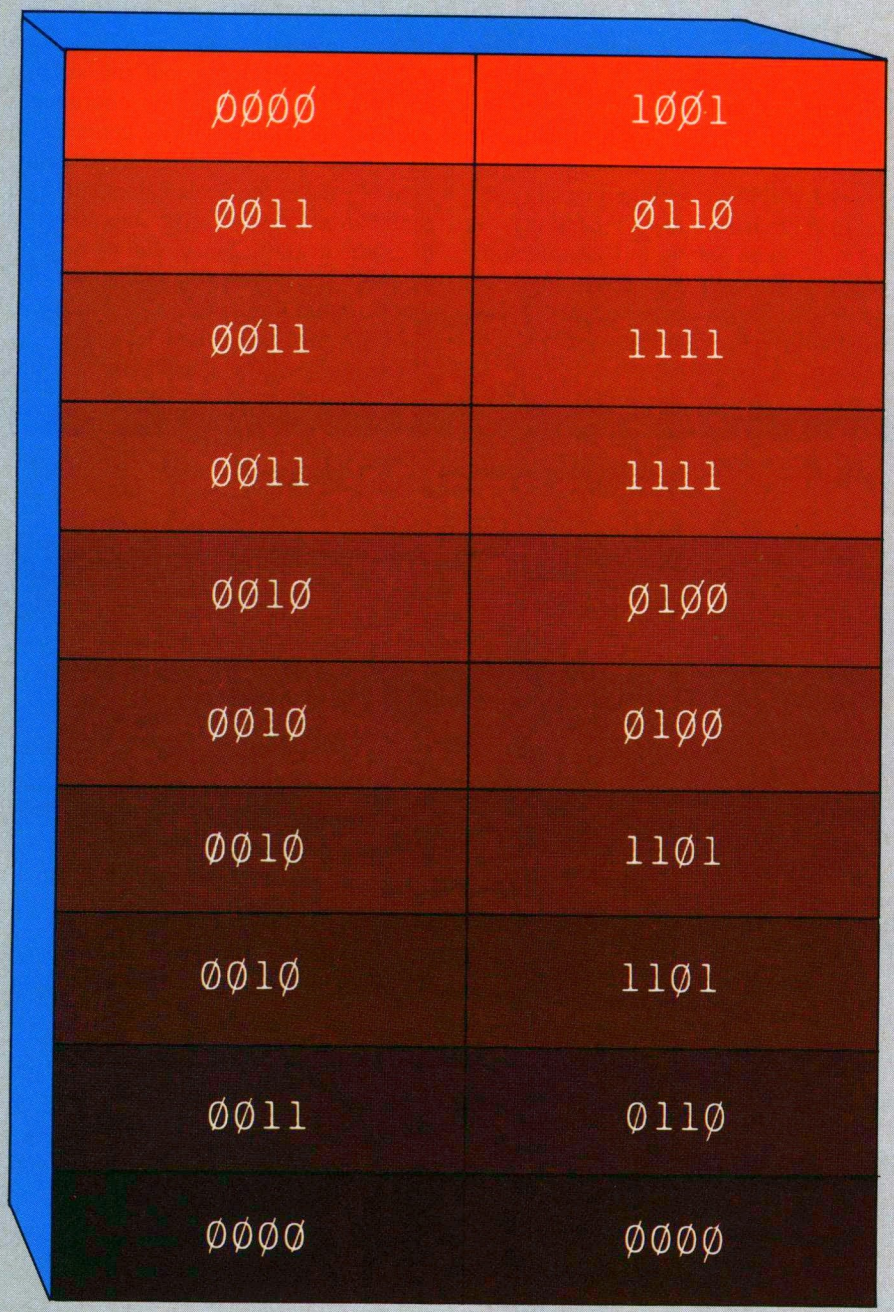


Figure 7.

Setting the Table

At this point we must put the shape definition into memory, where the computer can use it. Before we can key in the shape definition itself, we must first tell the computer how many shapes we're going to define (the maximum is 255). The next byte is unused, so we enter 00. The following *two* bytes represent the total number of bytes, from the first byte in the table (i.e., the one that told the number of shapes) up to the beginning of the shape definition. For any shape table with only one definition in it, the number of bytes will be four. We need two bytes here, because 255 is the largest decimal number that can be stored in one byte, and it is possible for shape definitions to be more than 255 bytes long. The number (two bytes) must be given in low-byte, high-byte order. This means we have to enter our hex 0004 as 0400. Figure 9 makes this a bit clearer.

01	number of shapes
00	unused
04	# bytes from start before
00	beginning of shape definition
09	shape definition beginning
36	
3F	
3F	
24	
24	
2D	
2D	
36	
00	end of shape definition

Figure 9.

Keying in the Code

How do you actually type in these hex codes? First, from BASIC, you use Apple's monitor by typing CALL −151 and a carriage return, which will replace the normal] prompt with a *. Second, you type the memory address at which you want your shape table stored. Follow this with a colon and the information from figure 9. When you are finished, type Control-C and a carriage return to return to BASIC. Thus, your typing looks like this:

```
]CALL -151   <RETURN>

*6000:01 00 04 00 09 36 3F 3F 24
  24 2D 2D 36 00   <RETURN>
```

```
*<CTRL-C>  <RETURN>

]
```

Finally we must tell the computer where we put the shape table. We know that we stored it at address 6000 hex, a conventional spot since it will not interfere with most BASIC programs and rests a safe distance beneath DOS. The computer doesn't know yet to look for the shape table there, however. We must therefore set an address pointer. To give this information, we poke a value into locations 232 and 233 in memory. The number 6000 hex is equivalent to 24576 in decimal notation. You obtain the numbers to be poked by finding out how many 256-byte memory pages this decimal number represents, i.e., by dividing 24576 by 256. The result is 96 with a remainder of 0. So we type

```
]POKE 232,0
]POKE 233,96
```

And, to save it all on disk we type

```
BSAVE SHAPES,A$6000,L$E
```

Or, if you prefer working with decimal:

```
BSAVE SHAPES,A24576,L14
```

The A$ (or A) is followed by the memory address of the shape table, and the L$ (or L) is followed by the length or total number of bytes in the table.

To load the table again, type

```
BLOAD SHAPES,A24576
```

Of course, you can replace SHAPES with any legitimate filename.

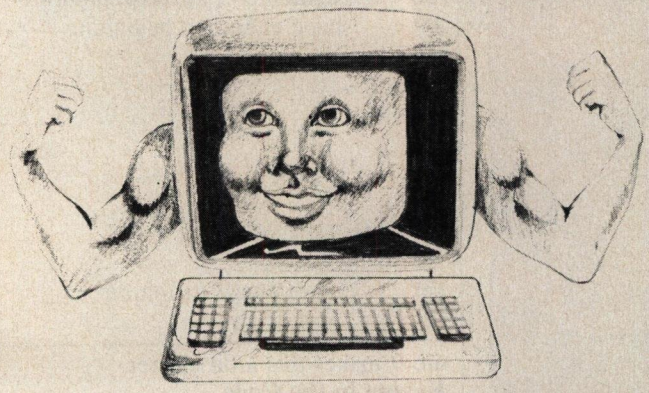
Scaling shapes to many times their original size often results in distorted shapes.

Since the shape-table information is in memory, in the sample programs that follow I will leave out the program lines that load the table and set the pointers. If you want to be able to turn off the computer and use the shapes later, however, save the table as described above and include the following lines at the beginning of your program:

```
1 PRINT CHR$(4);''BLOAD
  SHAPES,A24576''
2 POKE 232,0: POKE 233,96
```

At last we are ready to use our shape table in a program. We must, as usual, enter the High Resolution Graphics mode by typing HGR or HGR2. We must also select a color (blackl, green, violet, whitel, black2, red/orange, blue, or white2) by using HCOLOR. The colors listed may vary slightly on your particular monitor.

The simplest command is DRAW, which does what its name implies. DRAW puts a shape at specified coordinates on the screen. Its syntax is: DRAW *n* at x,y, where *n* is the number of the shape in the table, x is the horizontal coordinate (0 to 279), and y is the vertical coordinate (0 to 159 in HGR, or 0 to 191 in HGR2). If we put the starting point of the square at the coordinates 140,80, the square will be centered on the screen. You can alter the size of the figure by using the Scale command. You can change the scale from 0 to 255 (0 is the same as 256), but you must be a bit careful. Scaling shapes to many times their original size, especially if diagonal lines are involved, often results in distorted shapes. We won't run into this



A Personal Tutor™ Will Awaken the Sleeping Giant in Your Computer

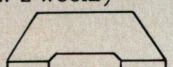
Whether you are a new user or experienced and looking to round out your expertise you will be impressed with Personal Tutor™ Training Tapes. Each package includes three detailed instructional tapes that will allow you hands-on-experience at your own pace. Our audio courses don't take control of your computer away from you, but gently guides you to master your system and the most popular software packages on the market. Now you will learn how to use the power of the system you have invested in.

FEATURES

- 3 audio-cassette tapes [No computer hook-up necessary]
- Effective step-by-step instruction in non-computerese language
- Quick reference summary card
- Sturdy vinyl protective case
- Written by technical consultants in coordination with an educational specialist
- Diskette with examples for Apple & IBM versions

ORDERING

Add $2.50 shipping each item
VISA/MC Accepted
Check (allow 2 weeks)
COD



Payable to:
Personal Tutor™ Associates
A Division of ExecSystems Corporation
P.O. Box 246
Clinton, MD 20735
(301) 856-2280

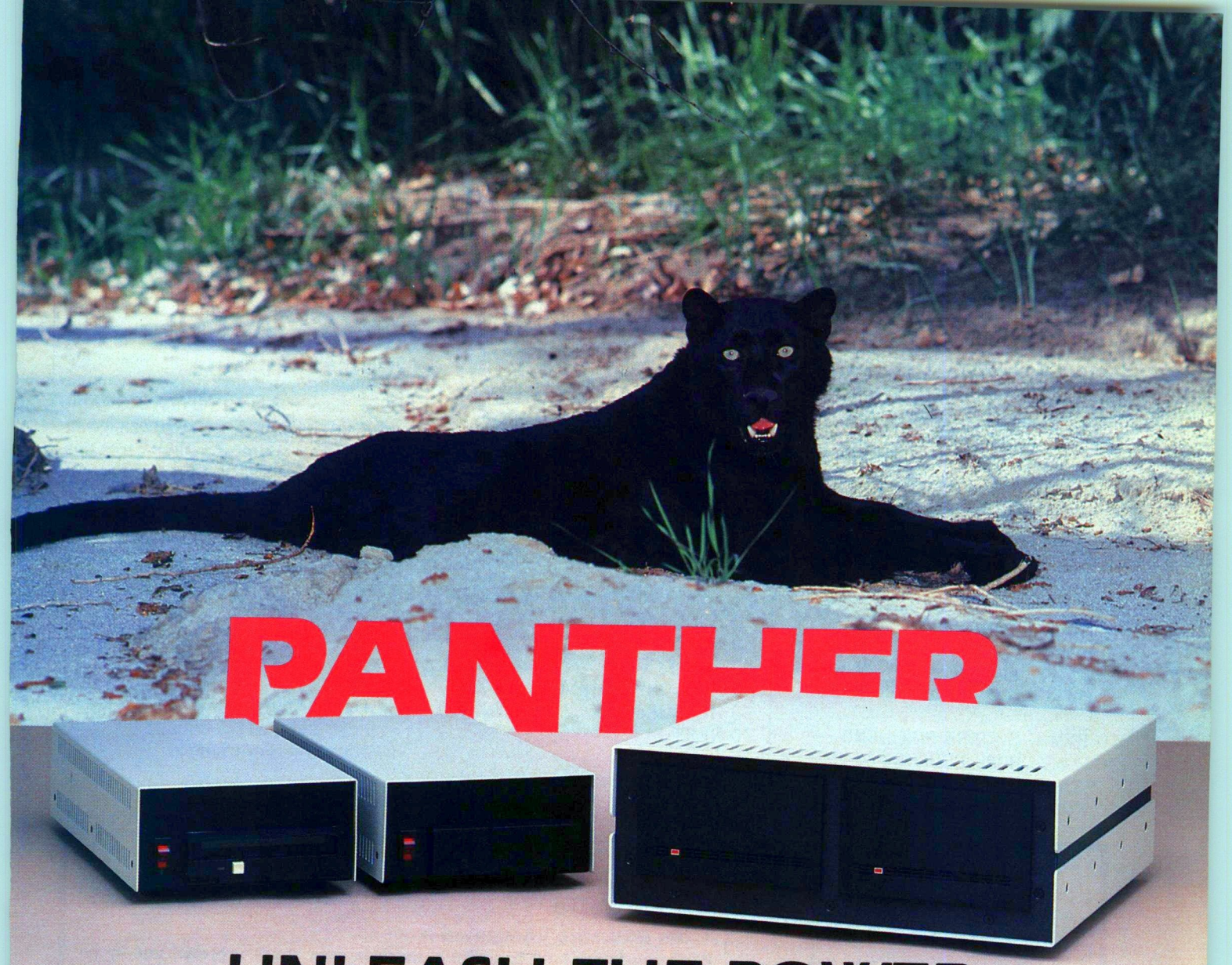
Specify system when ordering.

Note: Open packages not returnable.

PERSONAL TUTOR™ INSTRUCTIONAL TAPES

WORD PROCESSING:		DATA BASE:		SPREAD SHEET:		COMPUTERS:	
Apple Writer II®	39.95	dBase II®	59.95	VisiCalc®	49.95	Apple® //e	49.95
Screen Writer II®	39.95	DB Master®	49.95	TK! Solver™	49.95	IBM® PC	49.95
Bank Street Writer®	39.95	PFS®: File/Report	49.95	SuperCalc®	49.95	Commodore 64®	49.95
Super Text®	39.95	Easy Filer®	49.95	MultiPlan®	49.95	Vic 20®	39.95
Easy Writer II®	49.95	VisiFile®	49.95	1-2-3®	49.95		
Letter Perfect®	39.95	DataPerfect®	49.95	Easy Planner®	49.95		

CIRCLE 192 ON READER SERVICE CARD



UNLEASH THE POWER

Having been in the microcomputing industry for 10 years, V R Data Corporation has earned its reputation for microcomputing excellence. For over a year we have been making solid deliveries of the PANTHER establishing ourselves as THE SOURCE for proven, premium quality Winchester Disk Subsystems. The PANTHER satisfies the most demanding mass storage needs with capacities of up to 30 megabytes or more.

Utilizing 5 ¼" Winchester disk drive technology, and microprocessor based error correcting controller boards, the PANTHER continues to be the #1 choice of discerning professionals. Available with one or two drives in one enclosure, the PANTHER can support many combinations of fixed and removable drives.

Now V R Data Corporation proudly introduces the newest member in the Panther family of Winchester Disk Drives, the "CUB". The CUB is a sub-mini Winchester Disk Subsystem, representing the latest in innovative technologies. With advances such as 100mm thin film plated media with embedded digital servo, and switch mode power, the CUB placed V R Data well out ahead of the pack. Available in single (master) and dual (master/slave) drive configurations, the CUB provides the user with capacities up to 10 megabytes of fixed or removable storage media.

The CUB's sleek low profile design totally eliminates that overcrowded work area problem and adds a professional appearance to your system. The CUB removable media drives are ideal for 5 megabyte on-line storage as well as 5 megabyte backup for your fixed media drives. Adapter modules are availalbe for the most popular microcomputers. The PANTHER family of drives are availalbe at quality Computer Stores everywhere. If your dealer does not yet carry PANTHER Drives from V R Data, tell them the future has arrived.

VR data

777 Henderson Blvd. • Folcroft, PA 19032 • (215) 461-5300

CIRCLE 187 ON READER SERVICE CARD

problem here, however.

```
10 REM--SQUARE SCALE DEMO--
20 HOME: HGR: HCOLOR=3
30 ROT=0: REM EXPLAINED
   NEXT PARAGRAPH
40 FOR S=1 TO 20
50 SCALE=S
60 DRAW 1 AT 140,80
70 NEXT S
```

You can use the ROT command to rotate a shape. ROT=0 is the normal, upright position. ROT=16 rotates the shape 90° clockwise, ROT=32 spins it 180°, ROT=48 turns the shape 270°, and so on. You can choose ROT values anywhere between 0 and 64, inclusive. Values larger than 64 will simply repeat previous angles.

ROT only positions the shape at different angles, but it does not show the shape turning around to reach 180°, for example. Shortly, we'll look at ways to make the shape seem to spin. Meanwhile, the program below draws the square at several different angles.

```
10 REM--SQUARE ROT DEMO--
20 HOME: HGR: HCOLOR=3:
   SCALE=15
30 FOR R=0 TO 32 STEP 4
40 ROT=R
50 DRAW 1 AT 140,80
60 NEXT R
```

Now we come to moving the square. The easiest way is to draw the shape, erase it, and redraw it in a new location. We can use the following new program to draw the square at the left side of the screen, draw it in black (to erase it), and then draw it again further to the right.

The easiest way is to draw the shape, erase it, and redraw it in a new location.

```
10 REM--MOVE SQUARE RIGHT--
20 HOME: HGR
30 SCALE=2: ROT=0
40 FOR X=6 TO 273
50 HCOLOR=3: DRAW 1 AT X,80
60 HCOLOR=0: DRAW 1 AT X,80
70 NEXT X
```

Would it be faster to draw the shape, clear the screen, and then draw the figure in a new location? Try it, by changing line 60 to HGR and moving the HCOLOR=3 statement to line 20. You'll see that this seemingly easier method is slow and causes a great deal of flicker.

Another way to move the shape is to use the XDRAW command. XDRAW ignores HCOLOR and draws a figure in a color opposite to that of the background. In our case the square will be white. A repetition of the XDRAW command reverses the pixels of the square from white to black. This means the computer doesn't have to keep changing the value of HCOLOR. It may seem a bit difficult to see the speed advantage in this method, but for complex shapes this procedure is faster. To try XDRAW instead of DRAW, change the following lines in the previous program:

```
20 HOME: HGR: HCOLOR=3
50 XDRAW 1 AT X,80: REM DRAWS
   SHAPE
60 XDRAW 1 AT X,80: REM ERASES
   SHAPE
```

To make the square move still faster, you can add a STEP value to the FOR/NEXT Loop. For example,

```
40 FOR X=6 TO 273 STEP 3
```


FOR BUDGET BUSINESS AND TAX PREPARATION **TAXWIZ $29.96**

NOW, A PRICE BREAKTHROUGH FOR **HOME, PERSONAL OR SMALL BUSINESS** ACCOUNTING AND RECORD KEEPING

[ ] 8" SSSD (Standard IBM 3740 format)
[ ] 5 1/4" CP/M-80 [ ] Indicate computer format desired [ ] Single density [ ] Double density
[ ] 5 1/4" **IBM PC** - Now also available (and compatible)
[ ] VISA. [ ] MASTER CHARGE [ ] Check enclosed
_____ [ ] expiration date __/__/__
Signature _____
Name _____
Address _____
City _____ State _____ Zip ___
Home Phone (___)_____
Office Phone (___)_____
Shipping/Handling: add $4.00. CA residents: add $1.95 sales tax.

1. **No accounting background required.**
2. **If you know how to write a check in your check register, you know how to use TAXWIZ** including its utilities described in a 42-page document for reference.
3. **Utilities, user friendly,** mostly require a 'yes' or 'no' answer which allows every one in the family to use TAXWIZ (extensive error checking and fast response time).
4. **The status of your file and the menu are clearly displayed** on the screen at any time, so you need not go back and forth between menus.
5. **After reading the 2-page preface,** you will see how easy it is to use TAXWIZ with your current knowledge of writing checks. Then the **5-page introduction** will allow you to get started to **enter records, display, review, search, print reports, balance the bank statement, create/add/delete or change accounts, reconcile accounts,**... all this with a choice of **80- or 132-column printer for the spreadsheet,** allowing up to **200 accounts** and entries as big as **$999999.99.**
6. **Money back guarantee**—with return of this order within 30 days including the diskette in its sealed envelope unopened.
7. **Requires** a minimum of 48K of memory, 2 disk drives, 80-col screen and **CP/M-80** and works with corresponding cards on the **APPLE COMPUTER.**

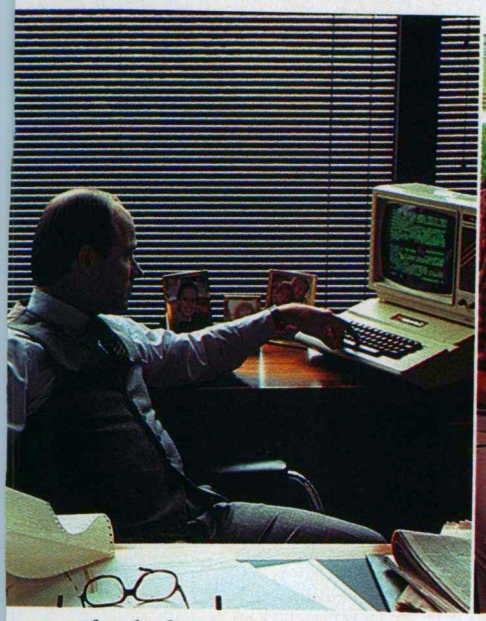
MAIL TODAY TO: **ADVANCED MICRO SYSTEMS**
26188 Adamor Road, Calabasas, CA, 91302
(213) 880-4670

Trademarks: CP/M, Digital Research; IBM PC, INT'L. Business Machines, TAXWIZ, Advanced Micro Systems (est. since 1977). All orders shipped within 3 to 6 weeks.

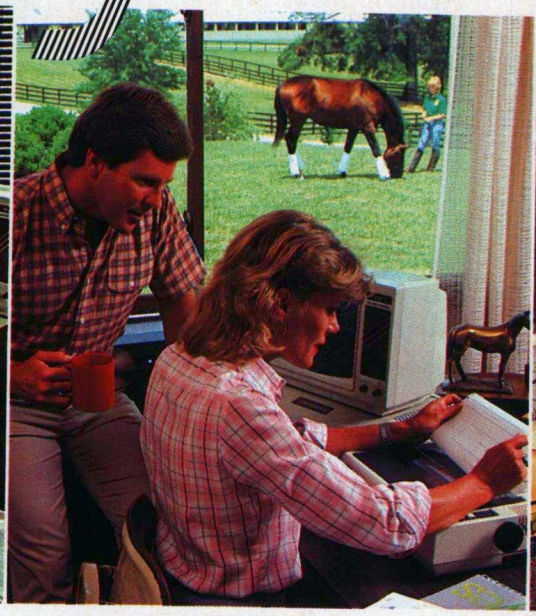
CIRCLE 240 ON READER SERVICE CARD

Your Apple's telephone.

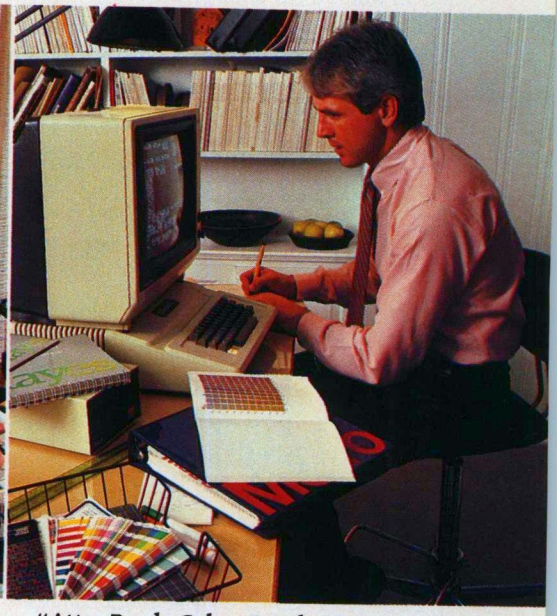
Hayes™



"Thanks for the prompt reply. Sure was a lot faster than waiting for the mail!"



"Gary: The pedigrees for next week's auction are as follows..."



"Attn. Prod., Sales, Purch.: Recommend 50% blue, 30% red screen for closest match."

A complete plug-in communications system for Apple® computers. From Hayes, the established telecomputing leader: the simple but sophisticated Micromodem IIe® plug-in board modem and its companion software, Smartcom I.™ Everything you need to expand the world of your Apple II, IIe, II Plus and Apple III. In one, convenient communications package.

With Micromodem IIe and Smartcom I, you can access data bases, bulletin boards, and the varied resources of information services. Plan your travel itinerary via computer, including flight numbers, hotel and rental car reservations. Retrieve and analyze daily stock and options prices. Work at home and send reports to your office. You can even do your gift shopping by computer!

Micromodem IIe. Think of it as your Apple's telephone. It allows your computer to communicate with any Bell-103 type modem over ordinary telephone lines, at 110 or 300 bits per second. Micromodem IIe installs easily in an expansion slot, and requires no outside power source. It connects directly to either a single or multiline modular phone jack, to perform both Touch-Tone® and pulse dialing.

Micromodem IIe dials, answers and disconnects calls automatically. And, unlike some modems, it operates in full or half duplex, for compatibility with most time-sharing systems.

A built-in speaker lets you monitor your calls when dialing. That way, you'll know if a line is busy. With Smartcom I, Micromodem IIe automatically redials your last number.

Micromodem IIe
Smartcom I

Discover how Micromodem IIe can help maximize the capabilities of your Apple. While Smartcom I software will minimize *your* efforts.

Smartcom I companion software. For effortless communications. Whether you're a newcomer to personal computing or a seasoned professional, you'll appreciate the ease and speed with which you can perform any communications function. Thanks to Smartcom I!

Let Smartcom I guide you through a few easy-to-answer questions to tailor the program to your particular needs. Then you're ready to go!

Make a selection from the Smartcom I menu to manage your communications, files or printer. Program prompts guide you along the way. And menu selections let you easily make a call, end a call, or answer a call. When you're on the receiving end, your Micromodem IIe answers automatically, even if you're not there!

Convenient! And so is the Smartcom I memory for phone numbers. Smartcom I stores three of your most frequently called telephone numbers and one prefix. Plus, it also remembers the last number dialed.

Smartcom I also provides a directory of the files stored on your disk. And lets you create, list, name, send, receive, print or erase files right from its menu.

Smartcom I is as versatile as you need it to be. It accepts DOS 3.3, Pascal, CP/M™ 3.0 or CP/M Plus™ operating systems. And accommodates up to six disk drives and several printer interface cards.

Like all our products, Smartcom I and Micromodem IIe are backed by excellent documentation and full support. Including a two-year limited warranty on Micromodem IIe and a 90-day warranty on Smartcom I!

Hayes®

See your dealer today. Then plug into the exciting world of telecomputing.

Hayes Microcomputer Products, Inc., 5923 Peachtree Industrial Blvd., Norcross, Georgia 30092. 404/441-1617.

FCC approved in U.S.A. Micromodem IIe is a registered trademark of Hayes Microcomputer Products, Inc. Smartcom I is a trademark of Hayes Microcomputer Products, Inc. Apple is a registered trademark of Apple Computer, Inc. Touch-Tone is a registered service mark of American Telephone and Telegraph. CP/M is a trademark of Digital Research, Inc. CP/M Plus is a trademark of Advanced Logic Systems. ©1983 Hayes Microcomputer Products, Inc.

CIRCLE 271 ON READER SERVICE CARD

If we have the computer calculate the new position before erasing the square, the shape will remain on the screen longer than it is off. This will reduce the flickering effect. The program below uses this technique. Lines 90-120 ensure that the square will stay on the screen. These safeguards are written in terms of the scale, so you can change the value of S in line 30 (to change the size) without having to alter other parts of the program. The number 3 in 3 * S corresponds to the number of pixels from the starting point to the edge of the shape.

```
10  REM--BOUNCING SQUARE--
20  HOME: HGR: HCOLOR=3
30  S=1: SCALE=S: ROT=0
40  IX=2: IY=2: REM INCRE-
    MENT
50  X=140: Y=80
60  XDRAW 1 AT X,Y
70  X1=X: Y1=Y
80  X=X+IX: Y=Y+IY
90  IF X>279-S*3 THEN
    X=279-S*3: IX=-2
100 IF X<S*3 THEN X=S*3:
    IX=2
110 IF Y>160-S*3 THEN
    Y=160-S*3: IY=-2
120 IF Y<S*3 THEN Y=S*3:
    IY=2
130 XDRAW 1 AT X1,Y1
140 GOTO 60
```

A. To replace the old square completely with one whose starting point is on the right side, type

```
]CALL -151   <RETURN>

*6000:01 00 04 00 36 3F 3F 24
  24  2D 2D 36 00   <RETURN>

* <CTRL-C>   <RETURN>

]BSAVE SQUARE2,A$6000,L$D
```

B. Alternatively, to make the old square shape #1 and the new square shape #2, type

```
]CALL -151   <RETURN>

*6000:02 00 06 00 10 00 09
   36 3F 3F 24 24 2D 2D 36
   00 36 3F 3F 24 24 2D 2D
   36 00     <RETURN>

* <CTRL-C>   <RETURN>

]BSAVE SQUARES,A$6000,L$19
```

Figure 10.

Just for fun, here are some programs that create interesting patterns with our little square. Any of these would take a long time to draw with HPLOTs. To see how the starting point of a shape can affect the way it is drawn, try making a new shape table with the square, beginning on the right side instead of the center.

Figure 10 shows two ways to create the new shape table, one of which includes the original. The programs

If we have the computer calculate the new position before erasing the square, the shape will remain on the screen longer than it is off.

marked SET SQUARE TO SIDE are particularly intricate if you use the new shape table, although you can run them with the original, of course.

In figure 10, the hex codes stand for the following:

```
02    number of shapes in table
00    unused byte
06    number of bytes from start to
00    beginning of shape #1 definition
10    number of bytes from start to
00    beginning of shape #2 definition
      (Note that 10 is in hex and corre-
      sponds to 16 in decimal.)
09-00 shape definition #1
36-00 shape definition #2
```

Sample Programs

Note: If the shape table (new or old) is not in memory when you type in the following programs, you will get unpredictable results. See the section entitled "Keying in the Code" if you have turned off the machine since saving the shape table.

```
10 HOME: HGR: HCOLOR=3: R=0
20 FOR S=1 TO 33
30 SCALE=S: ROT=R
40 DRAW 1 AT 140,80
50 R=R+1
60 NEXT S
70 HCOLOR=0: ROT=32
80 FOR S=33 TO 1 STEP -1
90 SCALE=S: ROT=R
100 DRAW 1 AT 140, 80
110 R=R-1
120 NEXT S
130 FOR T=1 TO 300: NEXT T
140 GOTO 10
```

```
10 REM--SET SQUARE TO SIDE--
20 HOME: HGR: HCOLOR=3
30 FOR S=1 TO 16 STEP 5
40 SCALE=S
50 FOR R=0 TO 60 STEP 5
60 ROT=R
70 DRAW 1 AT 140,80: REM DRAW 2
   IF YOU PICKED METHOD B
80 NEXT R,S
```

```
10 REM--SET SQUARE TO SIDE--
20  HOME:  HGR:  HCOLOR=3:
SCALE=15
30 FOR R=0 TO 60 STEP 5
40 ROT=R
50 DRAW 1 AT 140,80: REM DRAW 2
   IF YOU PICKED METHOD B
60 FOR T=1 TO 150: NEXT T
70 NEXT R
```

```
10 REM--SET SQUARE TO SIDE--
20 HOME: HGR: HCOLOR=3
30 FOR R=0 TO 64 STEP 8
40 ROT=R
50 FOR S=1 TO 18
60 SCALE=S
70 DRAW 1 AT 140,80: DRAW 2
   IF YOU PICKED METHOD B
80 NEXT S,R
```

Axing Some Questions

Now let's draw that hatchet man we promised earlier. To start, we must decide what shapes we'll need. First we'll take a side view of a man. Next we'll need an outstretched arm and a bent arm. Finally, we'll need a hatchet. We'll draw the target with ordinary HPLOTs, since it doesn't need to move. To save space I'll just give you the final code, not all the intermediate steps.

```
]CALL -151   <RETURN>

*6000:04 00 0A 00 41 00 53 00 66
  00 03 20 24 27 64 0C AD 15 2E
  DE C4 96 F1 2E 15 36 36 36 36
  BE 36 36 36 36 36 15 BF 11 3F
  24 24 24 24 24 24 BC 92 92 92
  92 3F 24 24 24 24 24 24 EF 24
  24 24 64 05 00 <RETURN>

*6040:25 27 3E 2D 2D 2D 2D 2D 2D
  3E 3F 3F 3F 3F 3F 3F 00 25 27
  3E 3E 35 2D 2D 2D 2C 3C 3C 3C
  3C 2E 2E 36 3F 3F 00 3C 2E 2D
  2D 05 00 <RETURN>

* <CTRL-C>   <RETURN>

]BSAVE HATCHET,A$6000,L107
```

THE BEST WAY TO INCREASE THE VALUE OF YOUR APPLE:

CONNECT IT TO THE WORLD.

TRANSEND

THE WORLD JUST KEEPS GETTING SMALLER.

Transend electronic communications software for the Apple is now faster and easier to use.

For the beginner: Menus guide you through each step. Hit a key to choose an option.

Once you've started: New HANDS-OFF macros do complete routines with just one command (or by pushing the "Power-On" button.) You can create macros of up to 33 commands, including terminal mode commands.

A HANDS-OFF command line can perform all your menu selections such as dial, receive, and print messages.

Choose the package you need: Transend 1™ connects you instantly to other computers and information services.

Transend 2™ sends information error-free. It's ideal for sending sensitive data with complete accuracy. And Transend 2 can send multiple files in one phone call.

Transend 3™ lets you schedule electronic mail deliveries with a minimum number of phone calls, from your unattended Apple to other unattended Apples. A built-in text editor lets you write and send messages without switching software.

Every Transend package includes a subscription offer to THE SOURCE℠.

Money-back guarantee. Try Transend on your Apple. If you're not satisfied, return it for a full refund.

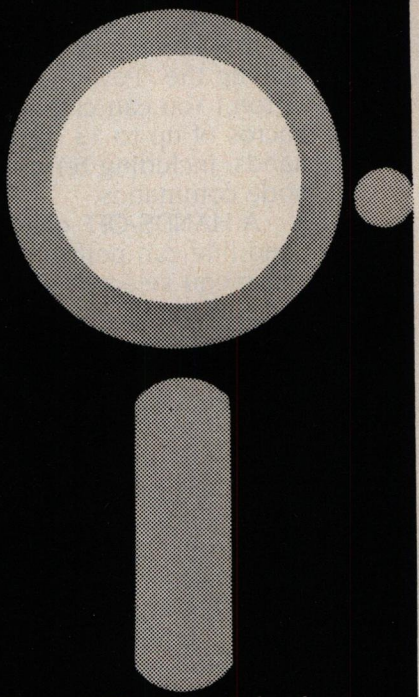
To learn more, ask for *The Who, What, Why, How and When of Electronic Communications* from Transend.

Transend Corporation
2190 Paragon Drive
San Jose, CA 95131
(408) 946-7400 SourceMail ST1422

Transend 1, Transend 2 and Transend 3 are trademarks of Transend Corporation. Apple is a registered trademark of Apple Computer, Inc. THE SOURCE is a service mark of The Source Telecomputing Corporation, a subsidiary of The Reader's Digest Association, Inc.

CIRCLE 123 ON READER SERVICE CARD

When you need competitive prices on Verbatim diskettes, you need SJB Distributors.



We're SJB. One of the fastest growing distributors in the country. And the reasons are simple. Our prices are competitive and we deliver fast.

SOFTWARE HOUSES: Verbatim Datalife available labeled or blank 'n bulk, with or without envelopes.

Call today about our quantity pricing.

Dealer inquiries invited.
C.O.D.'s accepted.

SJB DISTRIBUTORS, INC.
10520 Plano Rd., Suite 206
Dallas, Texas 75238
(800) 527-4893 or
(800) 442-1048 in Texas

CIRCLE 144 ON READER SERVICE CARD

You create the illusion of throwing the hatchet by drawing the body of the man and flipping back and forth between the straight and bent arms. This method is not unlike the way a cartoon artist draws still pictures that appear to move when shown in rapid succession. You make the hatchet spin by using the ROT command within a loop, and it simultaneously moves across the screen. Since our purpose here is to demonstrate the use of shape tables rather than to create a game, we'll assume that our hatchet thrower is a perfect shot. If you feel comfortable with the program at the end, you may wish to modify it so the hatchet doesn't always hit the center of the target. Perhaps you can combine parts of the square program to move the thrower around before he fires. (Be sure to move his arms as well as his body!)

This method is not unlike the way a cartoon artist draws still pictures that appear to move when shown in rapid succession.

```
1   PRINT CHR$(4);''BLOAD
  HATCHET,A24576''
2   POKE 232,0: POKE 233,96
10  REM--HATCHET THROWER--
20  HOME: HGR: HCOLOR=3
30  HPLOT 270,95 TO 270,120:
  REM TARGET
40  SCALE=1: ROT=0
50  DRAW 1 AT 100,100: REM
  MAN
60  DRAW 3 AT 100,100: REM
  BENT ARM
70  FOR T=1 TO 300: NEXT T
80  HCOLOR=0: DRAW 3 AT
  100,100: HCOLOR=3
90  DRAW 1 AT 100,100
100 DRAW 2 AT 100,100: REM
  STRAIGHT ARM
110 FOR X=104 TO 266 STEP 2
120 XDRAW 4 AT X,100: XDRAW 4
  AT X,100: REM HATCHET
130 R=R+4
140 IF R>64 THEN R=0
150 ROT=R
160 NEXT X
170 ROT=24
180 DRAW 4 AT X,100
190 ROT=0
200 FOR T=1 TO 200: NEXT T
210 GOTO 20
```

If You're Really Hooked on Speed

To reach arcade-quality animation, of course, you'll have to write a machine-level program. At that level you can make use of byte-move shapes that can move very quickly and without noticeable flicker. You can also add sound, move several objects at once, and detect collisions. This type of shape differs from ordinary shape tables in that it is plotted all at once, not as a series of vectors.

Although BASIC is too slow to take full advantage of byte-move shapes, you can get a feel for working with this kind of shape and movement without leaving our familiar language. For a good discussion of this topic, I suggest *Apple II Computer Graphics* by Ken Williams, Bob Kernaghan, and Lisa Kernaghan.

Drawing Your Own Conclusions

You can now write programs to rotate, enlarge, and move shapes with greater speed and with less flicker than you could after reading Part I of this tutorial. The more complex the shape, the more dramatic will be the increase in speed. Further, you now have greater control over shapes and a more readable program than that you can get with endless lines of HPLOTs. This greater control simplifies using the same program with different shapes. For example, you wouldn't have to change much in the moving-square program to move a triangle instead, if the triangle were defined in a shape table.

Shape tables are particularly useful for plotting figures that are to appear in several locations on the screen. You might even consider drawing the letters of the alphabet as shapes so you could plot them on the graphics page. (Another way to do this, of course, is to buy a commercial character generator, many of which provide several different type fonts from which to choose.)

The best way to learn to use them is simply to experiment for yourself, now that you have the background.

In any case, shape tables become much easier to use with practice. Once again, the best way to learn to use them is simply to experiment for yourself, now that you have the background and tools necessary. ✚

Microsoft SoftCard systems introduce your Apple to thousands of new programs.

More powerful Apples. When you plug a SoftCard™ system into the Apple® II, II Plus, or IIe, you're adding the ability to run thousands of CP/M®-80-based programs. Word processing, data-base management, analysis and forecasting programs—SoftCard gives your Apple access to thousands of software tools for use in your business or home.

Premium capabilities. Apple II or II Plus owners who want even more can add the Premium System. In addition to CP/M-80, it provides an 80-column upper-and-lower case video card and a 16K RAMCard™. Apple IIe owners can have CP/M-80, 80-column video, and 64K of RAM on a single card—the Premium SoftCard IIe.

Two computers in one. Any of these systems turn your Apple into two computers. One that runs Apple software and another that runs CP/M-80. Which means you'll double the utility of your computer.

Complete solutions. The SoftCard, Premium System, and Premium SoftCard IIe have everything you need. Easy-to-install circuit boards. The CP/M-80 operating system. Microsoft® BASIC. And the utilities you need to manage CP/M-80 files.

Why Microsoft? Microsoft was the first microcomputer software manufacturer. The very first. Today, Microsoft software is running on several million computers, worldwide. With a reputation for dependability and consistent product enhancement.

Ask your dealer. Ask about the superior application programs the SoftCard and Premium System make available to your Apple—high quality programs for almost every area of home, business and professional use. Then ask for a demonstration of the complete SoftCard, Premium System, or SoftCard IIe. And introduce your system to some of those thousands of new programs.

BETTER TOOLS FOR MICROCOMPUTERS

MICROSOFT™

MICROSOFT CORPORATION
10700 NORTHUP WAY
BELLEVUE, WASHINGTON 98004

Microsoft and the Microsoft logo are registered trademarks, and SoftCard and RAMCard are trademarks of Microsoft Corporation.

CIRCLE 247 ON READER SERVICE CARD

Picture it!

Graphics processing that's easy, flexible and fun!

Let PIXIT do the difficult work for you. You don't have to be an artist or programmer, just select predrawn shapes from the "PIXIT" shape library - or create your own! The possibilities are infinite.

Create A Shape
Create or modify pre-colored or standard HI-RES shapes using simple keystroke commands.

Shape Table Editor
Combine up to 128 shapes in one table. Add or delete shapes anywhere in table.

Font Library
A variety of sizes and styles of upper and lower case text fonts.

PIXIT Shape Library
A convenient selection of pre-drawn shapes, including: Education, business, family fun, arcade, communication, space, safety, 3-D geometrics, cartoon characters, electronic symbols, music and textures.

User Shape Library
Build your own library of shapes.

Picture Editor
Create a picture using mixed text and graphics, circles and lines, colorfill, and shape tables. Print the picture, save it to disk for use in other programs or for future editing.

Applications
Animation, charts and graphs, program development, slide shows, program titles, education, games

No programming skills needed.

Works like a word processor for Applesoft shape tables.

No additional hardware required.

PIXIT requires a 48K Apple II, Apple II + or Apple //e with ROM Applesoft and DOS 3.3

So whether you've just started, or you're a seasoned HI-RES hacker, you'll appreciate the unmatched power and simplicity of PIXIT . . . and its price.

But that's not all. PIXIT was designed with the classroom in mind. Which means extensive product testing and a professionally developed users guide. Simple menus, a help screen, and friendly documentation make this a productive tool for home, education, business and the arts.

Apple is a registered trademark of Apple Computer, Inc.

Pictured at left, Mike Darooge, Author.

$49.95 at your local software store or direct from BAUDVILLE.
Visa and Master Charge accepted, Michigan residents add 4% sales tax.

BAUDVILLE, 1001 Medical Park Dr. S.E.
Grand Rapids, Michigan 49506 Phone (616) 957-3036
CIRCLE 156 ON READER SERVICE CARD

BAUDVILLE T.M.

The classic Milton Bradley games you loved as a child are now computer games for the whole family!

Remember how much fun you had as a kid playing Go to the Head of the Class and Game of the States? They were so much fun you didn't realize you were *learning* at the same time!

Now, Milton Bradley is proud to announce that these ever-popular educational games have been formatted for use with Apple II, IIe home computers. Learning has never been so much fun!

GO TO THE HEAD OF THE CLASS

A highly competitive general knowledge game for ages 8 and up. Players advance from desk to desk by giving correct answers to over 300 questions on vocabulary, geography, math and history. Three levels of play are available — junior, senior, or graduate — so the whole family can play at once!

GAME OF THE STATES

How much do you know about the 50 states? This game gives you five ways to find out: Name the State; Name the Capital City; Abbreviation Game; Name the Neighbors, and Major Cities.

Plus . . . these other new fun ways to learn.

HEY TAXI!

Use addition, subtraction, multiplication, or division to make money and win! This math facts fun and action game turns you into a cabbie. You pick up passengers, calculate and collect fares, outmaneuver the competition, avoid parking fines and speeding tickets, and you must earn your pay before your shift ends.

EXTRA, EXTRA

You're a news reporter, and you must dig up the answers to Who, What, Where, When, and Why by reading the available information. But you can't miss your deadline! Three levels of play: Cub, Staff, or Ace Reporter. Reading was never more fun!

PUT TOGETHER, TAKE AWAY

Race against the clock with two Fast Facts games, or select any one of six skill levels. Discover how easy addition and subtraction can be. There's INSTRUCTION if you need it, PRACTICE if you want it, and the MASTERY QUIZ if you dare! Attractive graphics make the learning fun.

Plus, to learn more about computers, Milton Bradley has developed four new computer literacy products: Let's Explore BASIC; Let's Explore Word Processing; Run with LOGO, and Solving the Computer Puzzle.

For more information . . .
Call Bev Oski
at 1-800-628-8608.

Learning was never so much fun.

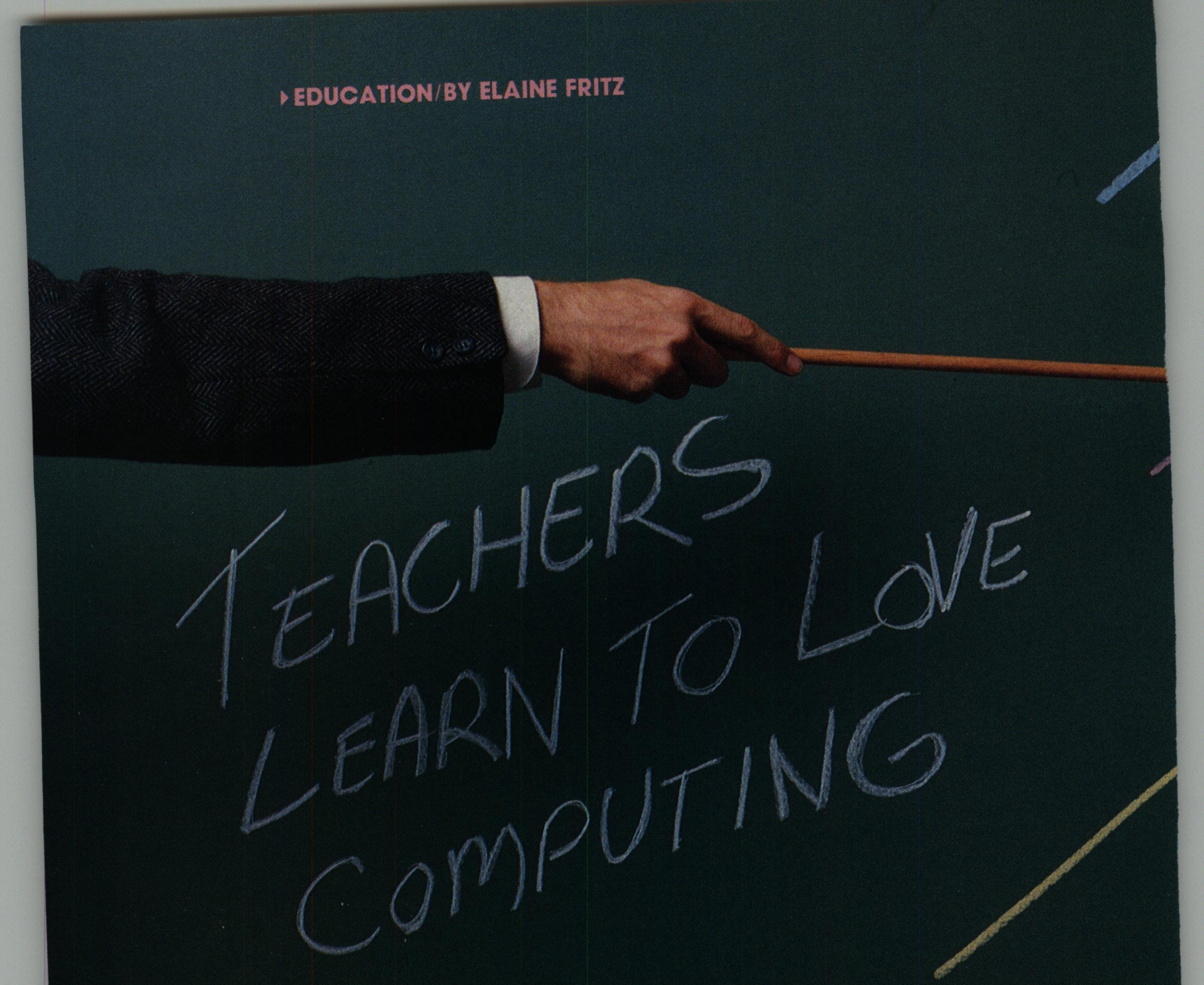
Milton Bradley Educational Software.

MB Key to Learning®

*Apple is a registered trademark of Apple Computer, Inc.

CIRCLE 228 ON READER SERVICE CARD

EDUCATION/BY ELAINE FRITZ



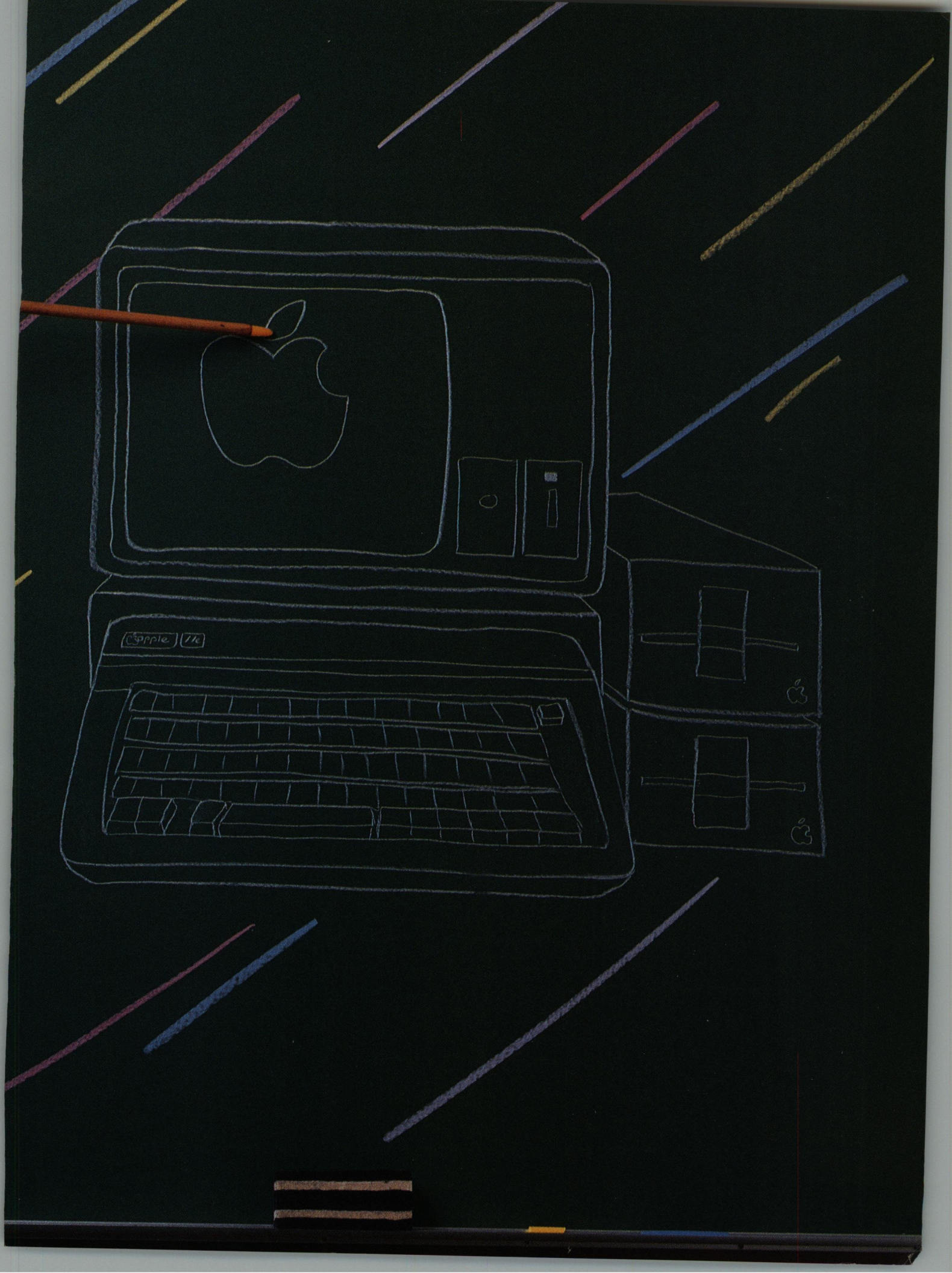
Computers can cause problems in schools. One of the biggest is getting people to go home.

Enthusiastic stories about schools that use computers for teaching have appeared recently in magazines such as *Time* and *Psychology Today*. It would be easy to infer that schools across the country have easily integrated computers into educational programs.

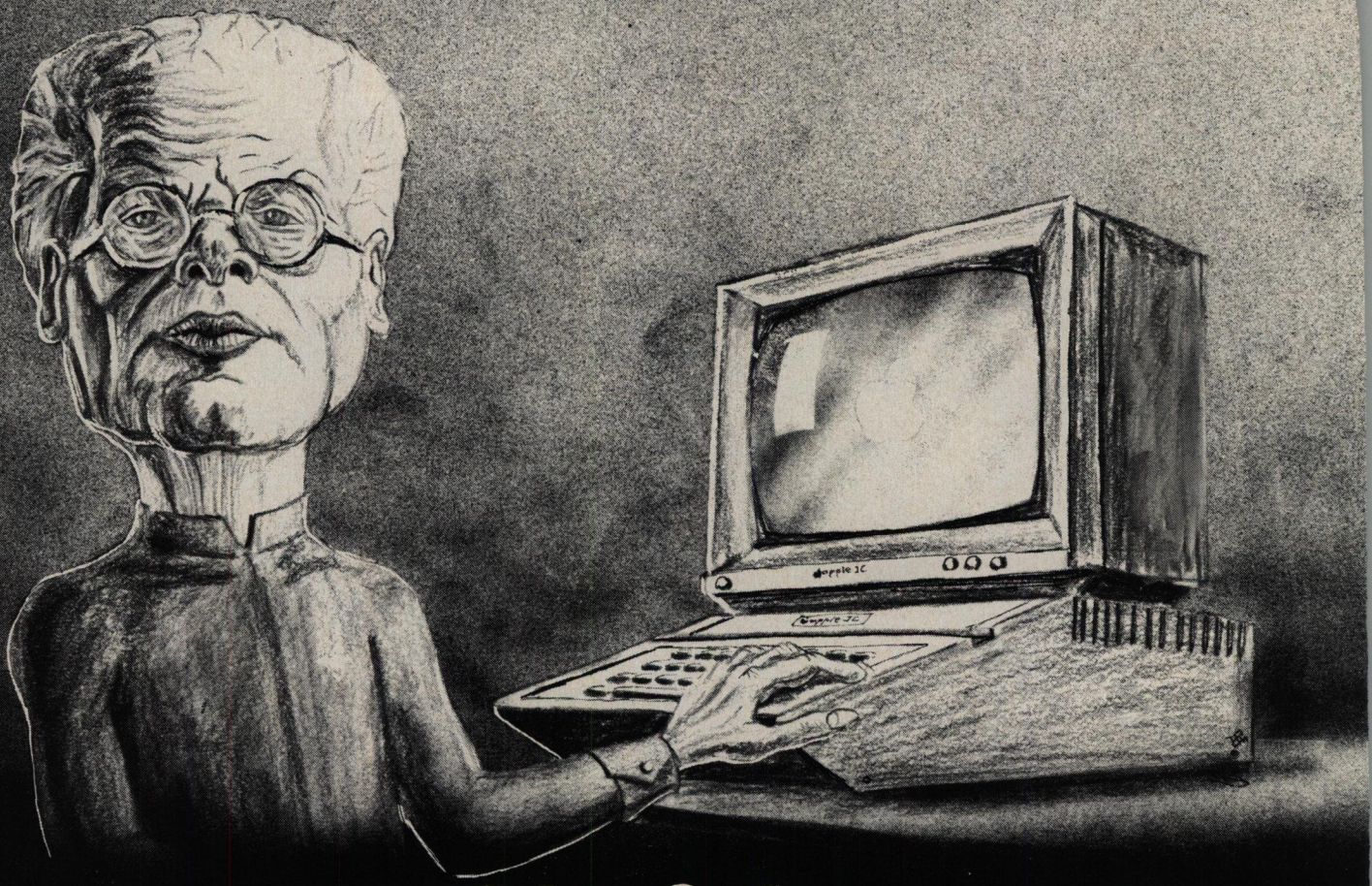
These stories generally focus on schools with resources not available to most public schools: on demonstration schools such as the Bank Street College of Education in New York City, or on schools with heavy manufacturer involvement, such as the Lamplighter School in Dallas. The Lamplighter School has received so much attention that inquiries are handled by the educational marketing department of Texas Instruments.

The overwhelming number of public schools have to improvise with limited funds and skimpy outside help, however. They have to be as entrepreneurial as any high-tech innovator starting out in a Silicon Valley home garage.

When the Eastridge Junior High School in Ridgefield, Connecticut, started using computers for its seventh- and eighth- graders five years ago, there were no curriculum guide-


Apple IIe

Finally, a 6502 Assembler that doesn't require a genius to operate.



LISA v2.6

You don't need an I.Q. of 200 to learn assembly language on your Apple II or Apple*IIe*. All you need is the best 6502 assembler around: **Lazer's Interactive Symbolic Assembler (LISA v2.6)**. LISA is the easy-to-learn and easy-to-use system that will have even the absolute beginner up and running in a matter of minutes. In addition to LISA's clearly written 240-page manual more tutorial material is available for LISA than any other assembler *(including books by D. Fudge, R. Hyde, W. Mauer, and R. Mottola)*. LISA is the beginner's best choice.

Even if your I.Q. is 200, you'll appreciate LISA's speed, power, and ease of use. At 20,000 lines/minute it's 20 to 30 times faster than ORCA/M or Apple's own Toolkit assembler. That's why people like Bill Budge, Ken Williams, Brian Fitzgerald, Don Fudge, and Steve Wozniak use it every day. LISA is very usable. That's why it's the most often used assembler ever created for the Apple II.

LISA v2.6 is available for $79.95 at computer stores everywhere. If your local computer store doesn't have a copy you can order directly from:

Lazerware, 925 Lorna St., Corona, California 91720. (714) 735-1041

LAZERWARE

CIRCLE 147 ON READER SERVICE CARD

lines on which to model a program, so the school officials had to write their own. They wanted a computer licensing test for their students, so they had to write it and do the programming themselves to get it onto the computers. They picked up software here and there, but they still haven't found any textbooks that meet their needs.

When you track back to find out how a school got started using computers, you usually find that a staff member got excited over an application he or she saw somewhere, then championed it with colleagues back home.

Getting the teaching staff excited and trained seems to be the key to success.

Psychologist Ted Perry of the San Juan, California, School District was working with the deaf in 1975 when he visited the California School for the Deaf in Berkeley. "I saw one of my former students, who I knew had a 30-second attention span. I watched him working on an old Teletype that was connected to a Nova 800 computer," Perry said.

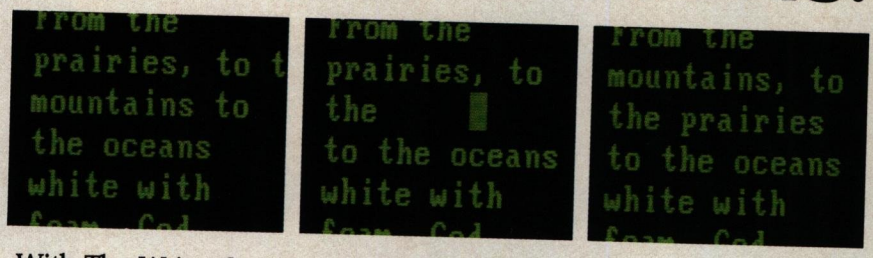
"When his time was up, 45 minutes later, they practically had to use a crowbar to get him off his chair. I went back to my district and said, "Give me half a million dollars, and I'll do exciting things.' " Since then, he and another educator have combined $400,000 in federal Title IV-C funds. They *have* done exciting things.

Lee Wille, director of math, music, and instructional computing in the La-Crosse, Wisconsin, school district, saw a demonstration of computer-assisted instruction (CAI) in music at a convention and thought it was "kind of neat."

Both educators since have been involved in their districts' addition of microcomputers to instructional programs. Their initial exposures to an exciting application led them, accidentally, to go about arranging for the use of computers in the way they now know is the correct order: first identify applications for computers, then find the appropriate software for the applications, and only *then* identify the hardware that runs the software.

"This classic way to do it isn't the

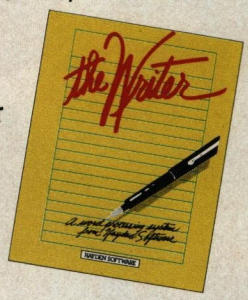
FOR JUST $60 YOU CAN MOVE MOUNTAINS.



With The Writer from Hayden Software, you can move "mountains", "prairies", sentences – or even entire paragraphs with ease.

Based on the powerful PIE:Writer, The Writer gives you all the word processing features you would expect in software costing hundreds more. And its simple format makes it very easy to use.

So when you're ready to move up to real word processing for very little money, The Writer* from Hayden is the only way to go.



For more information, see your local retailer, or call 1-800-343-1218 (In MA 617-937-0200). Hayden Software, 600 Suffolk St, Lowell, MA 01853.

*Runs on the Apple II, II+, IIe, the IBM PC and compatibles.

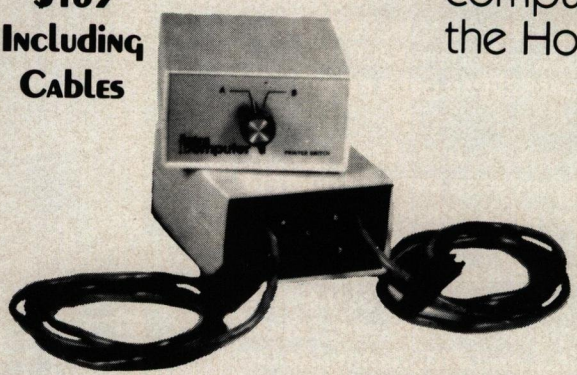
HAYDEN SOFTWARE

CIRCLE 267 ON READER SERVICE CARD

WHAT A SWITCH!

Intra's **Printer Switch** for all Personal and Business Computers lets your **W**ord**P**rocessor's copy be easily directed to either a **D**ot **M**atrix or **L**etter **Q**uality **D**aisywheel Printer. Compatible with all Centronics Parallel type interfaces, the **Printer Switch** is styled to match computer hardware in the Home or Office.

$165 Including Cables



master charge

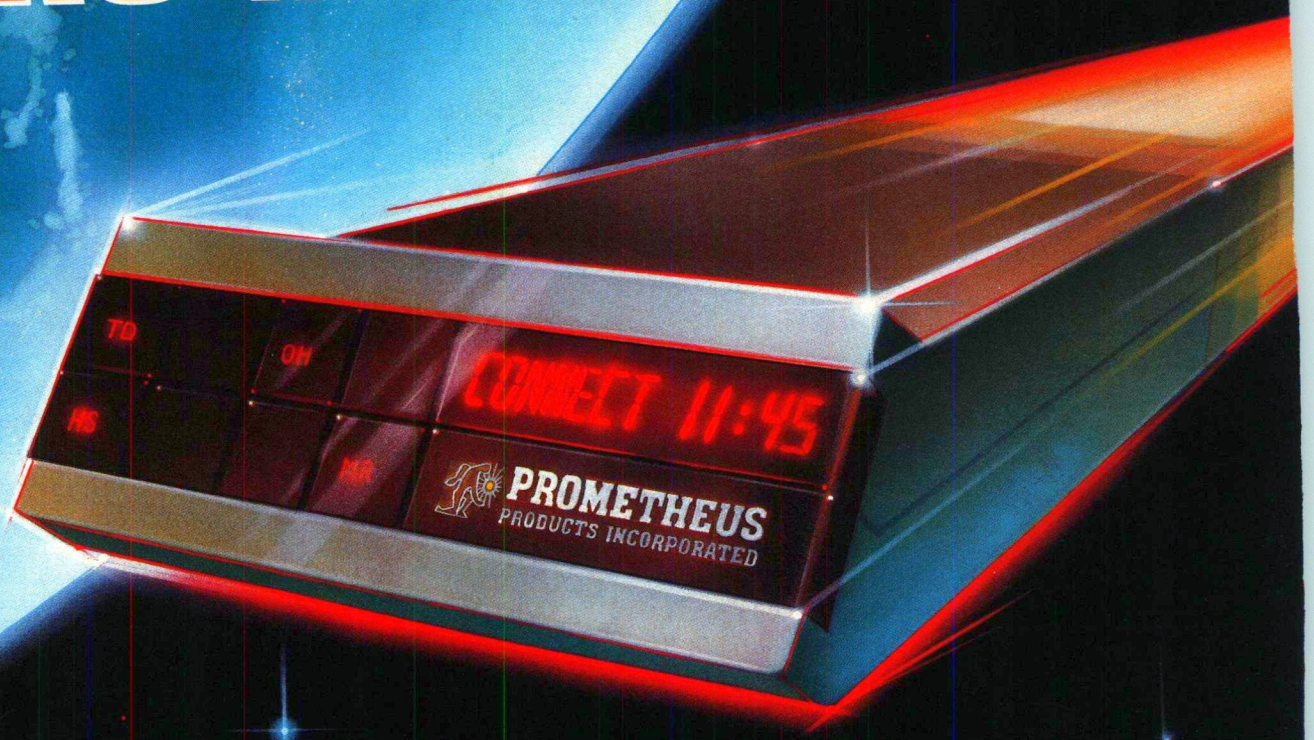
VISA

intra computer

101 W. 31st Street
New York, N.Y. 10001
(212) 947-5533

CIRCLE 186 ON READER SERVICE CARD

PRO-MODEM 1200



It's about time.

Time for your computer to make the telephone connection – with an intelligent, full 212A 300/1200 baud modem – with a real time clock/calendar – and with the capability to expand into a complete telecommunications system. It's time for PRO-MODEM 1200. Much more than just a phone modem.

When you're on-line, time is money. PRO-MODEM telecommunication systems help you save. By monitoring the duration and cost of your phone calls. And by sending and receiving messages, unattended, at preset times when the rates are lower. . .with or without your computer.

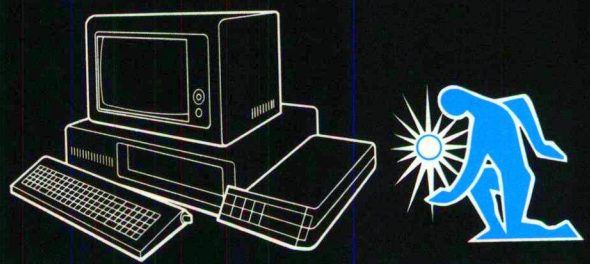
Compare the $495 PRO-MODEM 1200 with any other modem on the market. For example, you'd have to buy both the Hayes Smartmodem 1200 plus their Chronograph for about $950 to get a modem with time base.

PRO-MODEM 1200 is easy to use. A convenient "Help" command displays the Menu of operating command choices for quick reference whenever there's a question about what to do next. Extensive internal and remote self-diagnostics assure that the system is operating properly. Some of the other standard features include Auto Answer, Touch Tone and Pulse Dialing, and Programmable Intelligent Dialing.

PRO-MODEM does more. It lets you build a full telecommunications system with features like Auto Dialer, Incoming and Outgoing Message Buffering, Business/Personal Phone Directory, Programmable Operating Instructions, a 12-Character Alpha-Numeric Time and Message Display, and versatile PRO-COM Software. PRO-MODEM commands are Hayes compatible so you can use most existing telecommunications software without modification.

There's much more to the PRO-MODEM story. See your local dealer for complete details. He'll show you how to save time. And money.

Prometheus Products, Inc., 45277 Fremont Blvd., Fremont CA 94538, (415) 490-2370



PROMETHEUS

CIRCLE 122 ON READER SERVICE CARD

common way. Usually administrators say, 'The school down the road got some computers, so we'll get some too,' '' Wille says now.

The primary pitfall in not making these decisions in the proper sequence is that, typically, schools go for the inexpensive computers. This can be perfectly fine if they're only used for teaching programming. But pretty soon, teachers who have become computer-aware discover the growing array of software available and find that it won't run on the nice little computers they got so inexpensively.

Ted Perry now trains teachers in computer pedagogy at the Region 4 Tech Center in Sacramento, California, and he gets quite a few calls about which computer to buy. ''I don't always send everybody to Apple. If they *insist* that all they want to do is programming, nothing else, an Apple is a little expensive. We then talk about which language they want to teach in.''

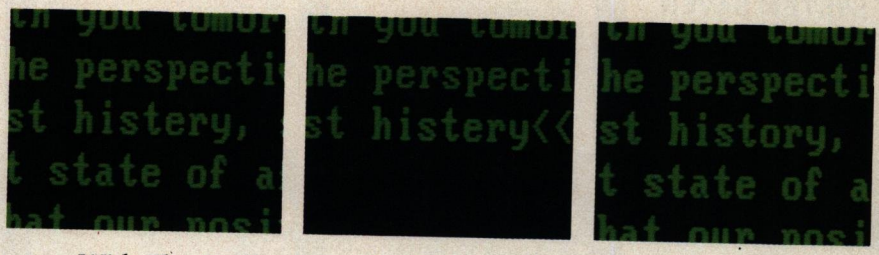
If they want to teach BASIC, they have quite a few choices, many under $100. But if they're teaching kids, he encourages them to teach Logo, and the choices get a bit more expensive. Then he says, ''Now that you're spending that much money, are you *sure* you only want to do programming?''

When Perry was setting up his Title IV-C project, he didn't know which computer it was going to be on, but he settled on Apples because of their dependability—''Back then there were a lot of strange machines that didn't stay running!'' He would still choose Apple, he says, because of the vast amount of software available. ''I really believe that there is more good educational software available for the Apple than for all the rest of the microcomputers put together.''

Even the most experienced schools have only been using microcomputers for four or five years, and they've amazed themselves with what they've been able to accomplish. They got their experience through practice, but some principles for implementing computers in education are beginning to emerge.

For example, many schools start too small. In Arcola, Illinois, school-board chairman Patrick Monihan says, ''The best thing we did was to make the investment in buying 12 Apples to start with. In other schools that I've seen, the math teacher has a computer, and his 20 students use it all the time. Not only do other teachers have a hard time getting to try it, but they also get turned off by this elitist corps of users.''

FOR JUST $50 YOU CAN REWRITE HISTORY.



With The Speller from Hayden Software, incorrect spelling is a thing of the past.

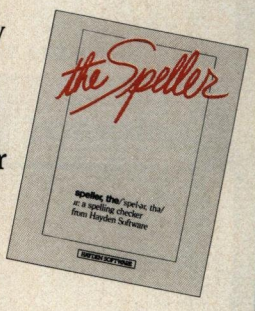
Its 20,000+ word dictionary automatically checks your spelling and makes corrections. Which means that your letters, papers and reports will be letter perfect time after time.

And while it's tough on spelling errors, it's easy on your pocketbook.

The Speller* from Hayden. Think of it as a dictionary for tomorrow at yesterday's prices.

For more information, see your local retailer, or call 1-800-343-1218 (In MA 617-937-0200). Hayden Software, 600 Suffolk St, Lowell, MA 01853.

*Runs on the Apple II, II+, IIe, the IBM PC and compatibles.



HAYDEN SOFTWARE

CIRCLE 266 ON READER SERVICE CARD

Craig Horsman, associate superintendent in the Monroe, North Carolina, City Schools, agrees. They started out with 11 Apples in their middle school, which gave every child in the school some contact with a machine. But when they added computers in the elementary schools, they started out with one or two machines, which were dominated by the couple of teachers who had some computer expertise. The rest of the school wasn't really affected.

Even the most experienced schools have only been using microcomputers for four or five years.

Getting the teaching staff excited and trained seems to be the key to success. Craig Horsman says that some teachers fear computers initially because they think they have to know how to put the computer together or do programming in order to use it. ''That's not true, any more than you need to be a mechanic in order to drive a car,'' Horsman says.

Sparking Interest

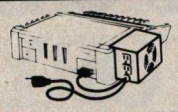
Learning to run the computer is certainly the first step. In LaCrosse, Wisconsin, Lee Wille says that when his staff was getting started, it once blew up 13 disk drives in three days. (The vendor was kind enough to fix them.) ''People weren't plugging them in right. So now we have them take the disk drive and the computer as a unit—you don't even unplug them.''

Once basic procedures are out of the way, according to Wille, ''our difficult task is not to teach people to use computers, but integrating computers in a pedagogically sound way into the existing curriculum. We offer staff development activities taught by teachers who are effectively using computers. They provide models that other teachers can use.''

Schools needing to catch the interest of reluctant staff members increasingly have access to several training options. They can import training from state or regional consortia, send teachers to college campuses for certification training, or bring in expert teachers from nearby districts. As schools get more experienced, they typically begin offering their own tailor-made in-service training.

Many school districts have had to let

KENSINGTON MICROWARE



SYSTEM SAVER
- Surge Suppression
- Fits Apple Stand
- Dual Outlet
- U.L. Listed
- Great Gift!

$65

QUADRAM

APIC (APPLE /// PARALLEL)	129.99
IPIC (IBM PARALLEL)	89.99
ERAM 80 column 64K IIE	$CALL
MICROFAZER	$CALL
QUADBOARD I or II (64K)	279.99
QUADCOLOR I	234.99
QUADCOLOR II	209.99
QUAD 512+(64K)	249.99
QUADCHROME MONITOR	499.99

QUADLINK 479.99

MICROSOFT

A.L.D.S.	75.99
APPLESOFT COMPILER	116.99
BASIC COMPILER	259.99
COBOL COMPILER	559.99
FLIGHT SIMULATOR (IBM)	34.99
MOUSE (IBM)	129.99
MULTI-TOOL BUDGET	109.99
MULTI-TOOL FIN. STMT.	69.99
SOFTCARD II	215.99
SOFTCARD PREMIUM (IIe)	359.99
64K IBM SYSTEMCARD	295.99
WORD	$CALL

MULTIPLAN 165.99

als

CP/M 3.0
279.99

Dispatcher 99.99

SMARTTERM II, or Z-CARD II
129.99

DTC

380 Z LETTER QUALITY DAISY WHEEL PRINTER

- 48 K Buffer
- 32 CPS
- Graphics
- 10, 12, 15 Pitch
- Proportional spacing

999.99

Sheet Feeder	599.99
Tractors	129.99
Cable (Please Specify)	49.99
NEW! Stylewriter	$CALL

SPINNAKER

ALPHABET ZOO (new)	19.99
DELTA DRAWING	32.99
FACEMAKER	21.99
FRACTION FEVER (new)	21.99
HEY DIDDLE DIDDLE	19.99
KINDERCOMP	19.99
MOST AMAZING THING	26.99
RHYMES AND RIDDLES	19.99
SNOOPER TROOPS 1	27.99
SNOOPER TROOPS 2	27.99
STORY MACHINE	21.99

ALL OF ABOVE 214.99

Beagle Bros Micro Software Inc.

ALPHA PLOT	24.99
APPLE MECHANIC	19.99
BEAGLE BASIC	24.99
DOS BOSS	15.99
DOUBLE TAKE	24.99
FLEX TEXT	19.99
FRAME-UP	16.99
PRONTO DOS	19.99
TIP DISK #1	14.99
TYPEFACES	14.99
UTILITY CITY	19.99

ALL OF ABOVE 234.99

EDUWARE

ALGEBRA I, II, or III	27.99
COMPUMATH	34.99
COMPUREAD	21.99
COMPUSPELL	21.99
COUNTING BEE	21.95
DECIMALS 3.0	33.99
FRACTIONS 3.0	33.99
PERCEPTION GAMES	19.99
PRISONER II	23.99
PSAT WORD ATTACK	33.99
RENDEZVOUS	27.99
SAT WORD ATTACK	33.99
SPELLING BEE GAMES	27.99
SPELLING/READING PRIMER	27.99
STATISTICS	21.99

APPLE SOFTWARE

BPI (GL, AP, AR, PAY, INV)	299.99
BRODERBUND Arcade Machine	44.99
Bank Street Writer	49.99
Choplifter	26.99
David's Midnite Magic	26.99
Loderunner	26.99
CENTRAL POINT Copy II+	25.99
CORVUS	$CALL
DATAMOST Aztec	29.99
Swashbuckler	26.99
Kids & Apple, VIC, COMM. ea.	14.99
DATASOFT Canyon Climber	17.99
Zaxxon	29.99
DLM Alien Addition	Sch-37.99, H-27.99
Alligator Mix	Sch-37.99, H-27.99
Demolition Division	Sch-37.99, H-27.99
Dragon Mix	Sch-37.99, H-27.99
Meteor Multiplication	Sch-37.99, H-27.99
Minus Mission	Sch-37.99, H-27.99
Spelling Wiz	37.99
Verb Viper/Word Invasion	37.99
Word Man/Word Master	37.99
Word Radar	37.99
EDUFUN Frenzy Flip Flop	23.99
EPYX Crush Crumble Chomp	22.99
GRAPH 'n CALC	149.99
HAYDEN Piewriter	129.99
Sargon II	26.99
INCREDIBLE JACK	129.99
JOR-AND Secret Agent	21.99
KENSINGTON Formatt II	26.99
L&S Crossword Magic	39.99
LEARNING CO Bumble Games	29.99
Bumble Plot	29.99
Gertrudes Puzzle	32.99
Juggles Rainbow	22.99
Magic Spell	26.99
Moptown Parade	26.99
Rocky's Boots	37.99
LIGHTNING Mastertype	29.99
MICROLAB Highrise	22.99
Miner 20-49er	29.99
Death in the Caribbean	26.99
Data Factory	229.99
ODESTA CHESS	53.99
Checkers	37.99
Odin	37.99
PEACHTREE	$CALL
PENGUIN Graphics Magician	44.99
SIERRA ON LINE Frogger	24.99
Screenwriter II	89.99
Screenwriter PRO	149.99
Ultima II	44.99
Cannonball Blitz	26.99
General Manager	169.99
Dark Crystal	29.99
SOFTWARE DIMENSIONS ACCT +II	$CALL
STATE OF THE ART	$CALL
SUBLOGIC Pinball	26.99
ULTRASOFT Serpents Star	29.99
Mask of the Sun	29.99
VISICORP	$call

APPLE HARDWARE

CDP 16K RAM CARD	**39.99**
Printer Card & Cable	39.99
Fan w/surge, 2 outlets	39.99
DAN PAYMAR Lower Case 1 (rev 1-6)	25.99
Lower Case 2 (rev 7)	19.99
DARK STAR Snapshot II	89.99
EASTSIDE Wildcard	119.99
FOURTH DIMENSION Drive	219.99
HAYES Micromodem II	254.99
HAYES Micromodem IIe	$CALL
HOME Repeat Key	19.99
KOALA PAD	89.99
KRAFT Joystick	44.99
KRAFT Paddles	31.99
LEGEND 128K Ram	359.99
MICRO-SCI Drive	219.99
MOUNTAIN CPS Card	159.99
NOVATION Applecat II	269.99
Applecat Upgrade 1200 Baud	309.99
ORANGE MICRO Grappler +	119.99
Bufferboard	119.99
Bufferd Grappler +	179.99
PADDLE ADAPPLE	24.99
SATURN 128K Ram	379.99
Accelerator II	444.99
Neptune 64K	199.99
Neptune 128K	299.99

ACCESSORIES

3 Ring Disk Sheets (10)	7.99
Printer Stand Small (plxgls)	24.99
Printer Stand Large (plxgls)	29.99
64K CHIPS (9x4 164-200ns)	79.99
16K CHIPS (8x4 116-200ns)	9.99
LIBRARY CASE	1.99
Flip 'n File (ORIGINAL)	17.99
Flip 'n File 25 Locktray	17.99
Flip 'n File 50 Locktray	27.99
Power Strip w/surge	17.99
HAYES 300 Baud Smartmodem	199.99
1200 Baud Smartmodem	474.99
NOVATION J CAT	104.99
NOVATION 103/212 AUTOCAT	429.99
NOVATION 103 SMARTCAT	169.99
NOVATION INFONE MAXI	869.99
NOVATION EXPANSION MOD	29.99
MX & FX 100 RIBBONS	7.99
MX & FX 80 RIBBONS	4.49
OKI 82, 83, 92, 93, GEM RIBBONS	2.99
USI Compumod RF MOD.	34.99

Fingerprint (Epson Enhancer) 44.99

IBM

½ Height DS/DD Drive	259.99
ALPHA Data Base MGR II	169.99
Apple-IBM Connection	129.99
Executive Package	115.99
Typefaces	79.99
ARMONK Executive Suite	27.99
ASHTON TATE dBase II	$CALL
Encyclopedia	59.99
Friday	$CALL
AST Boards	$CALL
BRODERBUND Apple Panic	21.99
Serpentine	26.99
CENTRAL POINT Copy II PC	25.99
DATAMOST Space Strike	21.99
Pig Pen	21.99
Real Estate Inv Prog	69.99
Write On	69.99
EDUWARE Algebra I	29.99
Prisoner II	29.99
EPYX Crush Crumble Chomp	22.99
Curse of Ra	14.99
Jabbertalky	22.99
Oil Barons	74.99
Star Warrior	22.99
Temple of Apshai	22.99
Upper Reaches of Apshai	14.99
GRAPH 'N CALC	149.99
HAYDEN Piewriter	129.99
HAYES 1200B Modem	439.99
KENSINGTON PC Saver	$CALL
KRAFT Joystick	44.99
LIFETREE Volkswriter	119.99
LIGHTNING Mastertype	36.99
LOTUS 1-2-3	$CALL
MICROLAB Highrise	22.99
Death in the Caribbean	25.99
Miner 20-49er	29.99
MOUNTAIN Hard disk	$CALL
NORTON Utilities	59.99
PC CRAYON	49.99
PC TUTOR	47.99
PERFECT SOFTWARE	$CALL
POOL 1.5	27.99
PLANTRONICS ColorPlus	409.00
SIERRA ON-LINE Frogger	26.99
Crossfire Lunar Leep, Mouskattakin	22.99
Golf Challenger	19.99
Ulysses & Golden Fleece	29.99
SIR-TECH Wizardry	44.99
SUBLOGIC Pinball	29.99
TMAKER	169.99
TG Joystick	44.99
TITAN 64K BOARD	499.99
VISICORP, Visicalc or Visidex	164.99
Visifile, Trend/Plot, Schedule ea	199.99
Visilink	$CALL
Visi-on	$CALL
Visispell	179.99
Visiword	269.99

EAGLE PC $CALL

SORCIM

SUPERCALC SUPER SPELLGUARD
119.99ea.

SUPERWRITER SUPERCALC 2
167.99ea.

APPLE, IBM & CP/M VERSIONS

Videx

APPLE WRITER PRE-BOOT	14.99
CHARACTER ROMS	24.99
ENHANCER II	99.99
FUNCTION STRIP	34.99
HARDSWITCH	16.99
MICROMODEM CHIP	24.99
PS10	169.99
SOFTSWITCH	25.99
ULTRATERM PRE-BOOTS	$CALL
VIDEOTERM W S/S + INV	219.99
VISICALC PRE-BOOT	39.99

ULTRATERM 249.99
VIDEOTERM 199.99

INFOCOM

ENCHANTER
DEADLINE
PLANETFALL
SUSPENDED
WITNESS
32.99 ea

STARCROSS
ZORK I
ZORK II
ZORK III
24.99 ea

CP/M VERSIONS $7.00 MORE

MONITORS

AMDEK	$CALL
PRINCETON RGB HZ-12	489.99
QUADCHROME RGB HX-12	499.99
USI Pi 1 9" Green 20 mh	116.99
USI Pi 2 12" Green 20 mh	119.99
USI Pi 3 12" Amber 20 mh	146.99
USI Pi 4 9" Amber 20 mh	136.99
USI 1400C Color Composite	288.99
OSBORNE Monitor Cable	$CALL
TI Monitor Cable	$CALL
RCA 6" Male-Male	2.99
IIe to Princeton card/cable	139.99

TAXAN 12" Green 18 mh 134.99

MicroPro

CALCSTAR	89.99
DATASTAR	179.99
MAILMERGE	139.99
REPORTSTAR	199.99
SPELLSTAR	139.99
STARINDEX	109.99
SUPERSORT	139.99
WORDSTAR PRO	389.99

INFOSTAR & WORDSTAR
Call for special pricing

Continental

APPLE SOFTWARE 1983 BOOK	9.99
ATARI SOFTWARE 1983 BOOK	9.99
APPLE GRAPHICS BOOK	14.99
CPA (GL, AP, AR, PAY) ea	149.99
FCM/FL 1st CLASS MAIL (AP)	61.99
FCM/FL 1st CLASS MAIL (IBM)	71.99
HOME ACCOUNTANT+ (IBM)	84.99
HOME ACCNT.+ (KAYPRO, OSB)	59.99
HOME ACCNT.+ (TI PRO)	119.99
PROPERTY MANAGEMENT	299.99
TAX ADVANTAGE	39.99
ULTRAFILE (IBM)	$CALL

HOME ACCOUNTANT
Apple, Atari, Commodore **$44.99**

DISKETTES

DYSAN 5" SS/DD (10)	31.99
DYSAN 5" SS/DD (100)	299.99
MAXWELL 5" SS/DD (10)	27.99
MAXWELL 5" SS/DD (100)	259.99
MAXWELL 5" DS/DD (10)	37.99
MAXWELL 5" DS/DD (100)	359.99
VERBATIM 5" SS/DD (10)	24.99
VERBATIM 5" SS/DD (100)	229.99
VERBATIM 5" DS/DD (10)	36.99
VERBATIM 5" DS/DD (100)	349.99

Dysan — **BOX or CASE**
Double-sided, double density
10/box 38.99 — **100/case 369.99**

PRINTERS

C-ITOH PROWRITER	$CALL
EPSON (ALL MODELS)	$CALL
OKIDATA 82A	384.99
OKIDATA 83A	629.99
OKIDATA 84P	969.99
OKIDATA 92	489.99
OKIDATA 93	859.99
STAR GEMINI 10X	$CALL
STAR GEMINI 15X	$CALL
STAR DELTA	$CALL
TRANSTAR	$CALL

RIBBONS IN STOCK FOR MOST MODELS

SMITH CORONA TP2 499.99

COMPUTER DISCOUNT PRODUCTS

SAN JOSE:
860 S. Winchester Bl.
San Jose, CA 95128
(408) 985-0401
MON-FRI 8AM-7PM
SAT.-SUN-HOL. 10AM-5PM

MAIL & PHONE ORDERS
860 S. Winchester Bl.
San Jose, CA 95128
(408) 985-0400

SAN FRANCISCO:
1230 Market St.
San Francisco, CA 94012
(415) 626-2244
MON-FRI 10AM7PM
SAT-SUN-HOL. 10AM-5PM

- No Charge For Credit Cards
- Prices Subject To Change
- Software Sales Are Final
- Min. $4.00 Shipping Charge
- Purchase Orders Call First

VISA · AMERICAN EXPRESS · MasterCard

APPLE IS A REGISTERED TRADEMARK OF APPLE COMPUTER INC. IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES CORP.

CIRCLE 290 ON READER SERVICE CARD

their younger teachers go because of declining enrollments, but apparently age is no determinant of enthusiasm for learning computers. In a weekend certification program, one university trainer recently had a principal who looked and talked like a Swedish grandmother. She told him, "I got into this computer stuff because I hated them and thought they shouldn't be in the schools. And then they *got* me!"

Training

Ted Perry's Region 4 Tech Center is one of 15 in California, all mandated to assist schools in putting computers into the classroom. Training is in such demand that the center teaches classes in as many as three shifts a day, and this summer they were running from 7 A.M. to 9 at night.

Here's a sample of Tech Center classes:

- An awareness class called Introduction to Computers. It runs for six hours and covers drill-and-practice, simulations, tutorials, word processing, spreadsheets, databases, and programming. The emphasis in on comfort and seeing that these applications could be useful in the classroom.
- An in-depth class that runs for three days. It goes more deeply into the areas covered in the awareness class, and participants work on miniauthoring formats such as The Game-Show format or Tic-Tac-Shoe.
- Classes in three levels of Logo: an introduction to it, classroom use of it, and an in-depth course that covers word handling and numerical functions.
- A class for which people have to sign up in threes: a parent who's volunteered for classroom work, a teacher, and a child. Each one plays the roles of the other two some of the time.

Side Benefits

In Perry's part of California, the average teacher age is 48, and it's been a long time since some of them have been students themselves. Perry is delighted with an unexpected benefit of the popularity of computer in-service training: It's an opportunity for teachers to review and improve their basic teaching skills.

"There have been opportunities to upgrade methodological skills, but only a small percentage come in and say, 'Gee, I want to do it better.' But almost *everyone* is coming in and saying, 'OK, how do I use the computer in the classroom?' Instead of just giving them a format in which to use computers, I have them examine what they're doing in the classroom, what outcomes and processes they want. Then they're examining their teaching methods, but doing it in a safe way, because what we're really talking about is 'How do I use computers?' "

Student Whizzes

The Eastridge, Connecticut, Junior High program is interesting for its astonishing degree of computer expertise among both staff and students. The school has 15 Apples in its computer-resource room, which is called the Apple Orchard. Each Apple has its own name: Macintosh, Granny, etc. The committee of teachers that supervises computer use is, naturally, the Apple Corps.

'We're already where I predicted a year ago we would be three years from now. I don't know where it all ends.'

Students must qualify for an operator's license by taking a test on an Apple before they have independent access to the Apple Orchard. David Sklarz, director of middle-school education, says that 85% of the seventh-graders have qualified before they finish the year. This leaves them in good shape for the more intensive, mandatory computer work they do in their eighth-grade year.

Eighth-graders learn a little about programming, are initiated into the mysteries of many software applications, and learn how computers are used in professions such as aviation, drafting, and design.

They also learn word processing, and last year, students produced the school's literary magazine instead of farming out the production and layout as before. Two years ago it won a national literary award, and they feel proudly confident that the new computer-produced version will win for them again.

"But you know," says Sklarz, "every time you expand the computers' use, find another application, people say, 'Oh gee, that's one less computer we can use on Tuesdays . . .' We're already where I predicted a year ago we would be three years from now. I don't know where it all ends. . . . It's exciting."

Computers have been accepted so fast in Eastridge that the staff has been taken by surprise by the new problems that

FOR JUST $50 YOU CAN KEEP UP WITH THE JONESES.

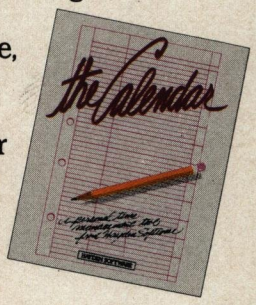
With The Calendar from Hayden Software, you'll not only keep up with the Joneses, chances are, you'll be there ahead of them.

The Calendar's multi-window design makes it easy to keep track of all your business appointments, make schedule changes, and plan ahead.

And when you check out The Calendar's* price, you'll also find that keeping up with the Joneses has never been easier.

For more information, see your local retailer, or call 1-800-343-1218 (In MA 617-937-0200). Hayden Software, 600 Suffolk St, Lowell, MA 01853.

*Runs on the Apple II, II+, IIe, the IBM PC and compatibles.



HAYDEN SOFTWARE

CIRCLE 268 ON READER SERVICE CARD

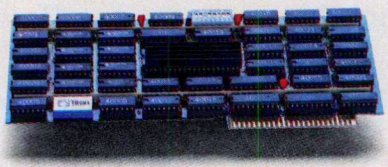
How to make your Apple run 3½ times faster.

Just plug in the Accelerator II® and watch your Apple® II or II Plus take off.

Imagine running VisiCalc,® DB Master,® Applesoft, Apple Fortran or Pascal without long delays. With the Titan Accelerator II, your Apple II or II Plus runs these programs a true 3½ times faster. The Accelerator II also runs your Franklin, Basis and other Apple II compatibles 3½ times faster. This faster computer response time means less waiting for you and an increase in your productivity.

This Titan exclusive has its own fast 6502 processor, 64K of high-speed memory, and built-in fast language card. It is transparent to your software and is hardware compatible with most standard peripherals. And you can turn if off from the keyboard to run your Apple at regular speed.

Find out how to run faster and increase your productivity without breathing hard. For information on the Accelerator II and other Titan microcomputer products, see your computer dealer or contact: Titan Technologies, Inc., P.O. Box 8050, 3990 Varsity Dr., Ann Arbor, MI 48107; Telephone (313) 973-8422.



Titan
TECHNOLOGIES, INC.
FORMERLY SATURN SYSTEMS OF MICHIGAN

Attention dealers. Ask us about our special demonstrator unit offer.

Sales and marketing by The MARKETING RESOURCE GROUP, Costa Mesa, CA.

Apple is a registered trademark of Apple Computer, Inc. VisiCalc is a registered trademark of VisiCorp, Inc. DB Master is a registered trademark of Stoneware, Inc.

CIRCLE 179 ON READER SERVICE CARD

seem to arise almost as fast as computer policy can be written. Suddenly they have to worry about monitoring their growing software library. Teachers want to check computers out over the weekend. Students want to pirate programs, or have managed to get into them and make modifications.

When students started bringing their own computer games, the staff strictly forbade it. Then they decided to have one day a month on which kids could bring in their games. "Then we had to create guidelines to say what's a game and what's not a game. We decided that whenever mental dexterity supersedes the manual dexterity needed, it becomes an educational game."

When teachers in LaCrosse, Wisconsin, started showing interest in checking computers out over weekends and holidays, it became official policy to encourage them. Instead of proving a problem, this became a too-lucky-to-be-true benefit: They had an IMC (Instructional Materials Center) burn down, but not a single Apple was lost, because the teachers had them all checked out. Since then, they've had two cases of breaking-and-entering during which other valuables were ignored, but closets around the IMC computer area were broken open in search of computers. They didn't lose any computers then, either.

Lee Wille says that the LaCrosse schools are concerned with monitoring teachers' acquisition of software. In order to make sure only quality material is used, the curriculum committee in each subject area keeps a list of approved programs. If a teacher wants software not on the approved list, he or she submits it to the committee for approval.

Wille believes that his district does an outstanding job of setting policy that promotes accountability. "We have developed a 150-page document that says how we use computers in the district. That's our major triumph!"

Tiny Trend Setter

The computer revolution in public schools hasn't been confined to the big, sophisticated school districts. In Illinois, an early trendsetter was tiny Arcola, a rural school district with a total of 750 students in grades kindergarten through 12. The main local industry is the broom-corn crop.

Students in the system include the Spanish-speaking children of migrant workers there for work in the cornfields as well as Dutch-speaking Amish children, who by law must attend school through the sixth grade.

In 1980, Arcola business-education teacher Jane Lockett chaired the computer committee that researched the use of computers. They found that most of the quality software for their purposes was written for the Apple, and in December of that year, the school board approved the purchase of 12 Apples. With more recent acquisitions, they now have one computer for about every 36 kids.

School-board chairman Patrick Monihan says that small rural districts' enrollments are sometimes so low it's difficult to keep a school going. His nine children attend local schools, and he has contributed a couple of Apples and some software to the schools, as well.

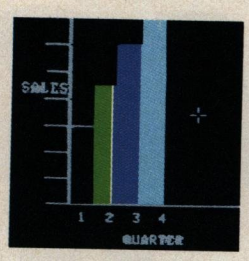
A former IBM systems engineer, Monihan says that he had always thought that one of the salvations of a small school district would be to have a teacher with ten computers, so that students could work simultaneously on a variety of subjects, freeing each teacher to be responsible for educating several children. His fantasy has come true, and it's a personal thrill for him to walk by the computers and see the district's kids, with their diverse backgrounds, hard at work.

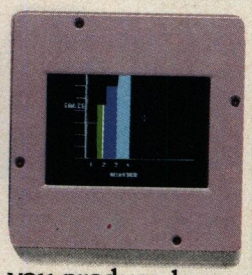
Jane Lockett found that locating software took most of the committee's time at the beginning, because there wasn't much quality material available then. She's still not totally pleased with all that is coming out. "Some publishers are producing software to support their textbooks, and I see this as the main way for software to be implemented in the classroom. Some of the independent software publishers have no educational background and do not follow the methodology of the classroom. The software may be cute, the graphics may be excellent, but it doesn't support what's being taught in the classroom," she said.

She's a great believer in communicating with the community. As chairman of the computer committee, she meets with the school board every year to report what's being done with computers. This report gets published in the newspaper.

The school-board members are the main channel for communication with the community, and the school district has a citizen's advisory committee on computer education. All this open communication has created loyalty in Arcola. The school has a foundation based mainly on memorial contributions: If a student dies, community members contribute to the foundation instead of buying flowers. With interest earned by foundation money, the district has been

FOR JUST $100 YOU CAN PRODUCE YOUR OWN SHOW.





The Producer from Hayden Software lets you produce low-cost, professional business presentations.

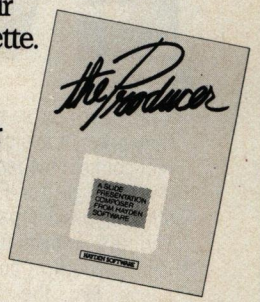
An extensive graphics capability means you can transform boring data into compelling charts and pictures. A rainbow of colors, multiple type faces and letter sizes are at your fingertips.

When your show is ready, The Producer will run it for you on your computer. For larger groups you can turn your show into 35mm slides or transfer it to video cassette.

So if you have an idea you want to sell, look into The Producer.*

For more information, see your local retailer, or call 1-800-343-1218 (In MA 617-937-0200). Hayden Software, 600 Suffolk St, Lowell, MA 01853.

*Runs on the Apple II, II+, IIe, the IBM PC and compatibles.



HAYDEN SOFTWARE

CIRCLE 269 ON READER SERVICE CARD

APPLE® MODEM. WITH EVERYTHING.

$129

Your best buy in modem history. The **Networker**™ a plug-in single-slot direct connect modem for your Apple II, II+, and IIe (or Franklin, Albert, or other Apple compatible computer). You are immediately linked to the vast network of computers — data bases like the Source,® Compuserve,® or Dow Jones,® friends, banks, businesses, and hundreds of local "bulletin boards." For only $129. There's absolutely nothing else to buy. And it even comes with software.

This is the modem that does it all, and does it for less. The Apple Communications Card is on board, so you won't need to buy one. That will save a bunch. It's 300 baud, the most commonly used type of modem. It comes complete with its own communications software on Apple compatible disk, giving you features ***no*** modem offers.

Like "data capture" to lock the messages into your Apples' RAM, and then move the information onto a disk for easy reference and review. A terminal program that turns your computer into a communications command center, displaying on-screen "help" menus, continuous updates of memory usage, carrier presence, baud rate, communications status, all while taking in and displaying information from any computer.

The **Networker** supports both originate and answer modes, so you can send and receive information, in full or half duplex modes. And its all easily programmable right from the keyboard of your Apple computer. All you do is plug **Networker** into any slot (except 0) in your Apple computer. It'll even ask you what slot it's in. It's that easy to use.

NETMASTER™ COMMUNICATIONS SOFTWARE

For $179 we include the even more incredible **Netmaster** software for advanced users. **Netmaster** is a "communications freeway" that lets you speed any Apple file to another Apple through noisy phone lines, without errors. **Netmaster** even includes its own Disk Operating System to control the flow of information and leave you over 40K of "buffer" memory from your 64K RAM. And there's always help when you want it. On screen. Status indicators keep you fully updated.

Netmaster will let you transfer games, computer graphics, programs, sales reports, documents, any DOS 3.3 file, all directly from disk to disk, all with computer (not telephone) accuracy. **Netmaster** is completely configurable to understand any computer, even mainframes. File size is unlimited.

But **Netmaster** is not stuffy. It will talk to the other communications packages like Visiterm® or ASCII Express® Of course they don't support **Netmaster's** superb error checking, that guarantees you won't miss even a comma. It doesn't only talk to the Networker either. It will also talk to those more expensive modems from Hayes and Novation.

And **Netmaster** is fast. It transfers information disk to disk three to five times faster than the others. Of course **Netmaster** is fully compatible with them. But if you want things to happen really fast, talk to another Netmaster.

We sell **Netmaster** by itself for $79, and even if you have another modem for your Apple, **Netmaster** is an outstanding value. It will even support auto dial and auto answer. **Netmaster** requires 48K of Apple memory, disk drive and DOS 3.3, and ZOOM's **Networker** modem or another modem. It can also be used without a modem when two Apples are hardwired together, using a 6850 or 6551-based interface card.

Networker, **Netmaster**, and **Networker/Netmaster** combo are all produced in the USA by ZOOM Telephonics, producers of the popular **DEMON DIALER.** The Networker is FCC registered, and all products come with a one-year warranty.

HOW DO I GET ONE? OR TWO?

Check with your computer dealer. Or call us direct at 1-800-631-3116, and we'll let you know where to get them in your area.

Massachusetts residents call 617-423-1288.

The following are trademarks: Apple by Apple Computer, the Source servicemark by Source Telecomputing, Compuserve by Compuserve, Dow Jones by Dow Jones & Company, Visiterm by Visicorp, ASCII Express by Southwestern Data Systems, DEMON DIALER by ZOOM Telephonics. ©1983 ZOOM Telephonics, Inc.

ZOOM Telephonics, Inc.
207 South Street, Boston, MA 02111

CIRCLE 195 ON READER SERVICE CARD

able to buy computer equipment.

Benefits are coming back to the community because it has supported the development of good computer facilities. The University of Illinois at Champaign, as well as a somewhat distant junior college, are offering evening computer courses using Arcola's computer lab. Businessmen and women who have just bought an Apple because that's the computer the Arcola schools use take these courses.

'You have to make the teachers comfortable with their own computer literacy, or they're threatened by the kids.'

Assessment

So how are schools doing in the computer revolution?

Frederick Williams, a professor in the Annenberg School of Communication, University of Southern California, is involved in a project to study how everyday schools are coping with implementation. The project's report, which Williams co-authored with his wife, Victoria, is based on an extensive literature review and formal observations of 12 different schools.

He thinks that they're doing pretty well and that the individual teacher should be the schools' main focus. Though widely acknowledged success strategies are still to emerge, one thing is clear—there's more than one model for success. He proposes that the best lessons for implementors are drawn from schools with similar circumstances.

Williams warns that computer literacy is an ambiguous term, and expectations differ between schools and the lawmakers who support computer-literacy legislation. Computer literacy is now mandated by California law, for instance, but to some people this may mean a detailed knowledge of programming, while to others it means knowing how to use a computer in your work.

For some youngsters in Palos Verdes, California, futurethink begins in babyhood. Williams' wife started the Palos Verdes Learning Center six years ago. Her forthcoming book from Bantam, telling parents how to teach their babies to use computers, is based on one of the center's programs, "Mommy and Me." She believes babies can learn with the help of computers almost from the day they're born.

Our children's technological future is in enthusiastic hands. ✚

THE VOICE OF EXPERIENCE

Advice to Schools Just Getting Started

Ted Perry (Sacramento, California): "Answer the questions: First, what do you want the computers *for?* Once you figure out what you want them for, find the software. From the software, choose the computers. Find someplace that will give you support—the dealer, the tech center, fellow teachers, or all of them—and tie into them. Take advantage of these resources."

Patrick Monihan (Arcola, Illinois): "I would concentrate on the teachers first, and set up a training program. We tried to train all of them. We still have some who are little hesitant, but we have more than half that are comfortable with the computer and are using it in their curriculum in some way or another."

David Sklarz (Ridgefield, Connecticut): "Before you can make them part of your curriculum, you have to sell it to the people who are going to use them in the classroom. You have to make the teachers comfortable with their own computer literacy, or they're threatened by the kids."

Craig Horsman (Monroe, North Carolina): "I recommend doing one school at a time so you can buy enough computers to make an impact. You'll get 'Why me?' or 'Why *not* me?' But one computer in a school doesn't *do* anything—it's like having a car with one tire."

Jane Lockett (Arcola, Illinois): "You have to communicate with the faculty, the administration, and members of the community. If there is no communication, there can't be any progress. People in the community aren't always aware of how schools operate. Everybody's got to know what's going on and be able to talk about it."

Lee Wille (LaCrosse, Wisconsin): "Now we have a big crisis about accountability in learning. Johnny not only can't read, but he can't compute either. But we don't need to dump lots of money into the school system; we just need to say what we're going to do and then do it. Computers can help us manage all those goals that we said we were going to accomplish."

TURN AN EPSON INTO A DAISY . . .

with the **SUPER-MX CARD** for the APPLE II or APPLE IIe.

The standard of printing excellence is the daisy-wheel printer. The SUPER-MX interface card improves Epson printers so they have just about the same quality print as the daisy-wheels! And this high quality is easily available to all Apple software, even copy-protected diskettes.

SUPER-MX Roman font is the standard.

Four optional font styles are available in addition to the standard Roman font that simply plug into the card:

LETTER GOTHIC is modern looking.
ORATOR is easy to read and good for speeches.
SCRIPT adds the personal touch.
OLDE ENGLISH is very formal and elegant.

BETTER THAN GRAPPLER!

The Super-MX card has all the Apple Hi-Res graphic dump commands that the Grappler card has including: double dumps (both pages side by side), dump from page 1 or 2, double size, emphasized, rotated, strip chart recorder mode, and text screen dump.

The two expansion sockets allow EPROM expansion to 12K to insure you that the SUPER-MX card will remain the most intelligent interface around.

Spies Laboratories
(pronounced "speez")
P.O. Box 336
Lawndale, CA 90260
(213) 644-0056

Apple II is a TM of Apple Computer, Inc.
Graftrax is a TM of Epson America, Inc.
Grappler is a TM of Orange Micro, Inc.

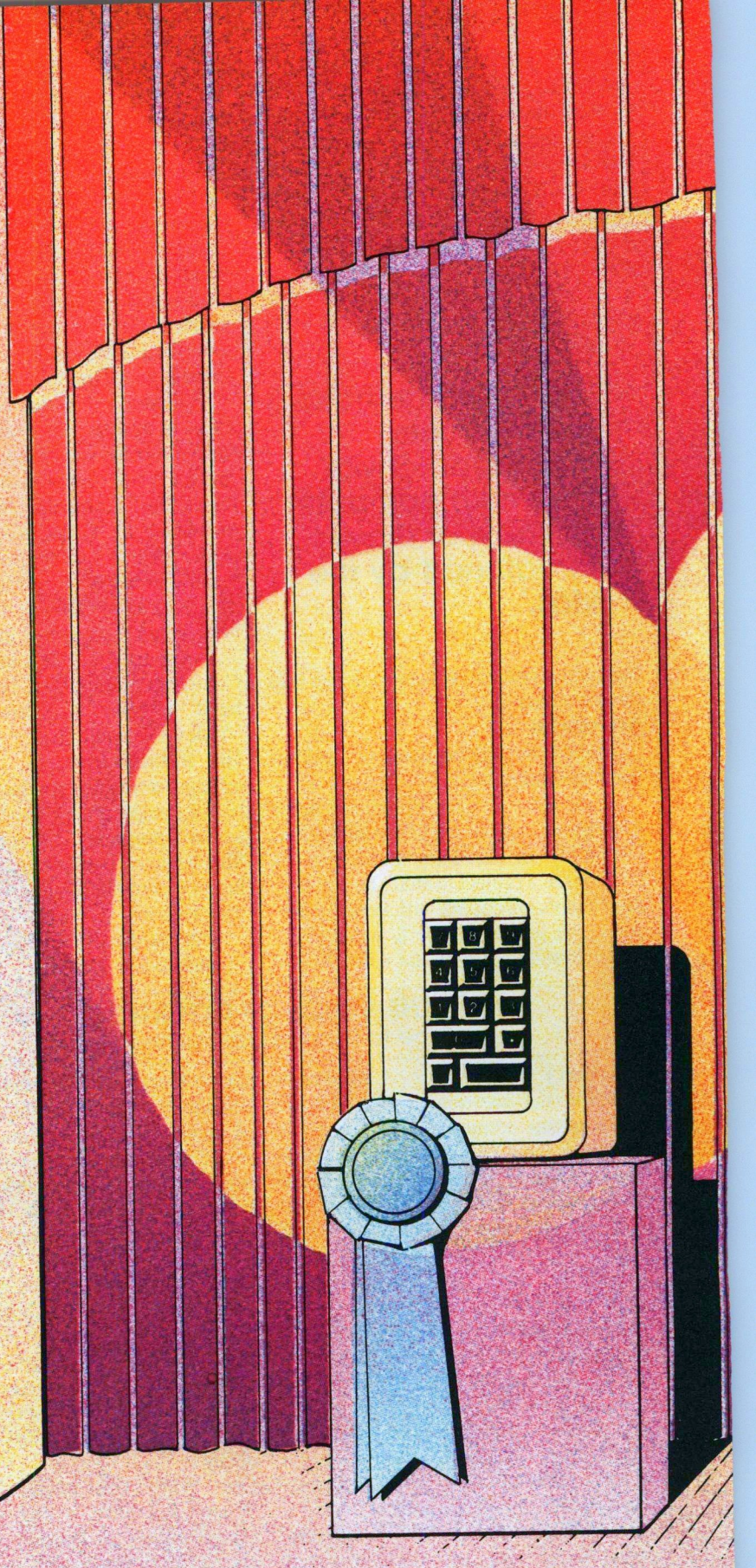
CIRCLE 238 ON READER SERVICE CARD

▶HARDWARE

BY ALAN ROSZKIEWICZ

THE PERFECT 10

A comparison of four ten-key pads for the Apple II family of computers



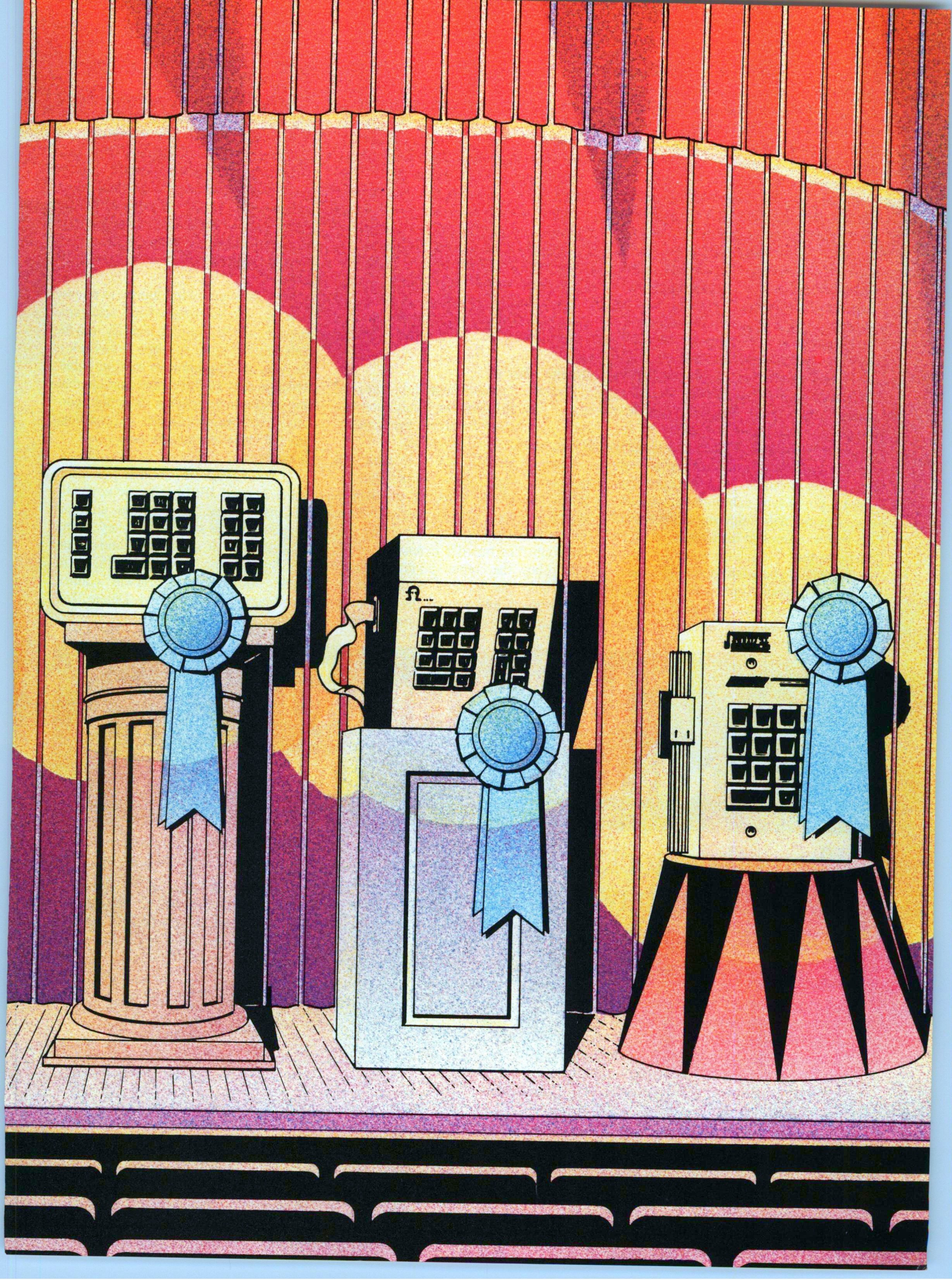
If you've ever used your Apple II, II Plus, or IIe for any serious accounting applications and have lamented the absence of a numeric keypad, this article is for you.

Keyboards vs. Keypads

One of the II series' major faults is its lack of a numeric keypad. Sure you can use the numbers in the top row of every "QWERTY" Apple keyboard—if your typing skills are good, you may find this approach no problem at all. Perhaps you wonder, however, why your accountant or office staff is taking an inordinately long time when using the Apple to enter columns of numbers that you swear took only a fraction of the time when the same person did it on an antiquated office calculator.

What's a Calculator?

Calculators are designed to provide the best possible means of data handling. They have their numbers arranged in a standard 3×3 matrix with the zero and



the decimal point located underneath. The function keys are usually grouped at the right of the numbers in a convenient column or block. These features are universal among office calculators. Computers should have no exemption from ergonomic laws.

So what's to be done to eliminate this bottleneck in data entry? You could buy an Apple III, but a simpler and cheaper approach would be to add a keypad to your II. This solution would allow improved efficiency with a minimum of expense and trouble. This path can bring benefits to your system without making you learn new procedures or programs.

Advanced Business Technology

In this article, I am going to discuss two basic approaches to adapt the IIs to accept an add-on keypad. The first involves soldering a connector to the encoder board on a II Plus. This is fairly easy, since the encoder board already has plated-through holes to accept a standard 9-pin D-type subminiature connector. Anyone with soldering skills should be able to complete installation in under an hour, but it's a job for your dealer or a technician if you wish to avoid any possible loss of your Apple warranty. If you happen to have an Enhancer II that comes with a connector already in place, then you can forget the above steps and simply plug in the keypad with its attached cable to the existing socket.

You would use this procedure for The Keypad from ABT, a keypad with little else but numbers, an Enter (Return) key, a minus sign, and a decimal point. The device is well constructed, but its size and light weight mean that you need an additional stand to position and stabilize the keypad for ease of use. If these basic keys are all you want or need, then you might consider this item with its stand.

With the IIe, just plug The Keypad into a supplied jumper, which you connect, in turn, to the Keypad Connector.

Omega Micro

Another approach to adding a keypad to an Apple II Plus is the installation of a controller board between the motherboard and the encoder board.

Omega Micro's KVA II uses this approach. The simple installation requires taking the case off the Apple, unplugging the keyboard connector from the motherboard, and reconnecting it to the controller board's extension cable. You plug the other controller-board cable into the vacated socket on the motherboard and mount the controller card on the provided mounting plate, which is affixed inside the Apple's case.

To use the keypad, you merely plug it into the controller board with its 20-conductor cable, which you then route out one of the back slots on the Apple.

This keypad has the standard ten digits, plus and minus signs, decimal point, and return keys. Some other keys that could prove useful for VisiCalc and word-processing systems are the space, escape, right-arrow, and left-arrow keys.

Omega Micro plans shortly to release a IIe version offering several selectable options, which will plug directly into the IIe's keypad pins. A minor drawback is the use of 20-conductor ribbon cable, which is only slightly more durable than the 16-conductor ribbon cable that connects to the game I/O port and is notorious for its failure rate in heavy use.

Jameco

If you have a IIe, another possibility is the Jameco JE614 numeric keypad.

This 14-key, 23-function auxiliary keypad has the standard 10-key format as well as VisiCalc cursor controls and word-processing functions. These include four-direction cursor control, scrolling in both directions, Delete, Tab, Home, and Enter. Curiously, this pad

How to avoid stock market whiplash!

When other stock market programs say buy...or sell... look out. The trend may be about to reverse itself.

The Maverick is a software program designed by Financial Software, Inc., a Registered Investment Advisor. Unlike other programs, only the Market Maverick helps you identify trends early, and tells you the likelihood of the trend continuing—or changing. It is a sound, practical, decision-making tool, designed for use with Apple II and IBM-PC computers.

Maverick's major benefits

* Focuses on the psychology affecting a stock rather than on a host of historical statistics which may or may not be important.
* Provides an easy-to-use framework for analyzing stocks in depth, far beyond our 960-issue data base.
* Provides investment insight with a no-nonsense newsletter and specific recommendations each month.

The Market Maverick is the **only** program designed exclusively to improve your investment results and help you avoid whiplash in the marketplace. If you're tired being the last one to discover a downtrend—or an upsurge—you're ready for the Maverick.

Call us toll free and order your Maverick today. Just $275 for the program, plus $120 for a full year of the newsletter, recommendations and monthly data update. Or ask about our Home Demonstration Package.

Apple II is a trademark of Apple Computer, Inc. IBM-PC is a trademark of IBM.

For more information during business hours 8-5 EST

From outside Ohio

1-800-392-2669

(In Ohio, call 216/338-6811)

FINANCIAL SOFTWARE, INC.

11401 Westridge Circle, Chardon, OH 44024

WASHINGTON (UPI) — The U.S. Air Force/NASA have developed an experimental spacecraft given the title XTM. Due to the vague description as to the design or purpose of the XTM, the press is still in the dark about many aspects of the craft or its intended mission. It has been discovered, however, that at least three pilots have been lost in the current flight testing program of the mysterious

TIME MACHINE I

Starfire Games offers you the ultimate challenge in adventure games: Time Machine I. First in a series of time travel episodes, Time Machine I catapults you into mind bending mystery where the extraordinary is commonplace and dangers are as real as any human experience.

You are the fourth test pilot to fly the joint Air Force/NASA XTM series experimental "craft", a vehicle which transverses through time, the true last frontier. Provided with the newly modified but still untested version of the craft, XTM-3, your mission is to rescue the three previous test pilots who are lost somewhere in the infinity of time itself.

Not far into the mission, you discover this task is more than you could have imagined. Never knowing what you will encounter next, you manuever your ship from one adventure to another. You draw upon every resource to survive events ranging from battles with Vikings in the past to outwitting aliens in the future for your ship, the lost pilots, even your very life. But prepare, your final challenge is to return to your own time era safely, a feat which has not been accomplished by any pilot before you.

Time Machine I is available for your IBM PC or XT (64K, disk drive), Apple II+ or IIe (48K, disk drive, DOS 3.3), Commodore 64 (cassette or disk drive), Atari 400 and 800 (48K, disk drive). TRS-80 version to be released soon.

Ask for Time Machine: $34.95 at your local dealer or order direct. Visa, Mastercard, Money Orders, Checks accepted (Calif. residents please add 6½% sales tax). Dealer inquires invited.

STARFIRE GAMES, Division Omnisoft Corporation
Dept. ST3, 9960 Owensmouth Avenue, Suite 32
Chatsworth, CA 91311
(213) 709-4900

IBM PC and XT, Apple II+ and IIe, Commodore 64, Atari, and TRS-80 are registered trademarks of IBM Corp., Apple Computers Inc., Commodore Business Systems Inc., Atari Inc., and Tandy Corp. respectively.

CIRCLE 283 ON READER SERVICE CARD

has no plus or minus keys, but it does feature right and left arrows, a help to VisiCalc users.

Installation of this unit is simple, taking no more than ten minutes. You just plug it into the keypad connector on the Apple's motherboard and pass the cable out one of the rear slots. Then you install a supplied ROM instead of the existing keyboard ROM, and you're done.

The unit is solidly constructed and matches the Apple's looks and style. A possible drawback is its use of a 16-conductor ribbon-connector cable, which could wear if you move the unit around very much. If you're careful, however, this need not be a problem.

Apple Computer

Finally, we have Apple Computer's Numeric Keypad II. This 24-key unit is perhaps the most like the standard adding machine in its format. Besides the usual ten digits and a decimal point, the center 4×4-key matrix has a 00 key in the center row.

Function keys are in 1×4 and 2×4 matrices on either side of the numeral keys. On the left side are right- and left-arrow keys as well as the Escape and Space keys. Right and left parentheses and the usual Return, plus, and minus keys are on the right-hand side.

Three other keys unique to this unit make it more like a standard calculator: multiplication and division signs as well as a useful Print key. Using the Print key before a group of entered numbers and arithmetic operations makes the Apple perform like a standard four-function calculator.

Installation in an Apple IIe means simply running the sturdy cord, with its strain relief, directly into the keypad socket. For the other IIs, the process is only slightly more difficult, as the case must come off. You plug a piggyback board into the keyboard socket and plug the displaced cable as well as the keypad cable into this board. In all, this procedure should take no more than 15 or 20 minutes.

The main complaint centered on the cramped style and placement of the various keys.

This unit places the keys on a level that should reduce arm strain, but it could be improved somewhat by a larger or angled Enter key. Basically, the Numeric Keypad II is a solid unit designed for dependability and utility.

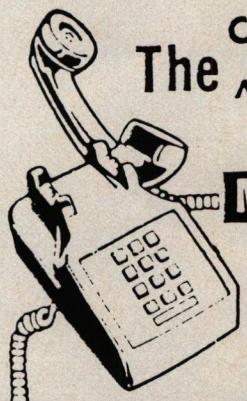
Views from the Office

After I completed the installation and equipment trials of the products I've just discussed, I brought these units to a group of bookkeepers. Here are some of their observations:

All tested keyboards gave the users an uncomfortable "home" position and allowed less-than-ideal arm positioning. The Apple keypad was deemed the most easy to adapt to, but all the units could benefit from several minor design adjustments.

The main complaint centered on the cramped style and placement of the various keys. Users who enter numbers by touch prefer to have the 5 key beveled slightly deeper than the others, in addition to having a raised dot.

The Enter keys, which the little finger normally presses, are ideally in a position far enough away from the number keys to allow a comfortable home or rest position for the hand on the keypad. These keys could also be a bit higher than the others and could be slanted upwards to the outside of the unit to prevent your fingers from falling off the keys. Remember, the object is to allow



COMPUTER
The Software Store

Mail Order Only!

WE OFFER . . .
- PROMPT, COURTEOUS SERVICE AND SUPPORT
- WIDE SELECTION
- and GREAT PRICES

for all your Software Christmas needs:

RECREATION • BUSINESS • EDUCATION • UTILITY
and accessories

SOFTWARE
for APPLE, ATARI, IBM, COM, VIC, TI, TRS, CP/M

WRITE OR CALL FOR FREE CATALOG

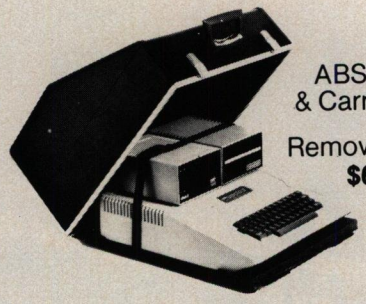
The Computer Software Store
2549 CLEVELAND. GRANITE CITY. IL 62040
9 A.M. - 6 P.M. MON.-SAT.

Call 1-800-851-8791 Illinois Res. Call 1-618-876-2155

We accept MasterCard or VISA

CIRCLE 119 ON READER SERVICE CARD

Travel With Your Apple...
Call (800) 847-4176!



ABS Storage
& Carrying Case
with
Removable Cover
$69.50*

*UPS Shipping Included.

Apple • IBM • Epson

Call for Complete Computer Case Catalog.
Credit Card Customers Call Toll Free

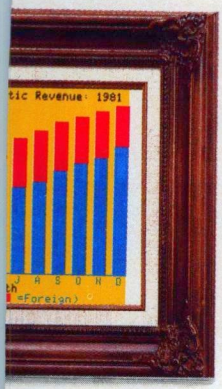
Fiberbilt
Ikelheimer-Ernst, Inc.
601 West 26th Street
New York, New York 10001-1199
(212) 675-5820 (N.Y. State)

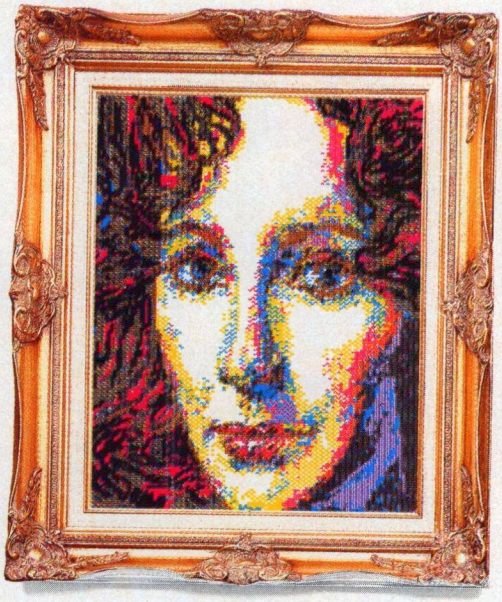
VISA master charge AMERICAN EXPRESS

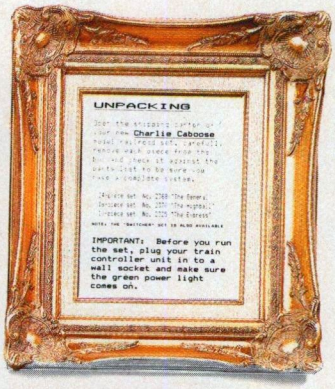
Gladly accepted

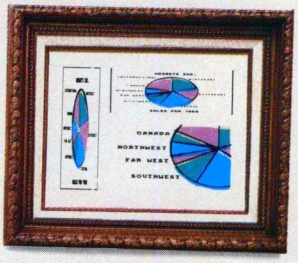
CIRCLE 159 ON READER SERVICE CARD

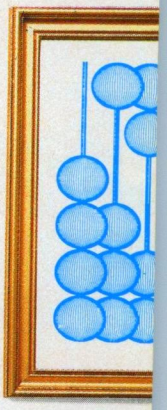
DID PICASSO DO IT?











Create Print Masterpieces with Text and Graphics.

Upgrade the Apple II, II+, IIe or III computer and any parallel printer to a complete text and graphics output system with the newest and most versatile interface, PKASO/U. (Pronounced "Picasso," the "U" is for Universal). And make use of every capability available from the printer. And gain additional text and graphics features to turn every printout into a masterpiece.

Get Greater Visual Range and Instant Screen Printouts.

Gain every state-of-the-art printing capability, including exclusive features not offered by any other interface:

- Magic Screen Dumps — instant, single-command snapshots of *any* image on the Apple screen, graphics or text. What you see is what you get!
- Print the graphics screen *any* size — from inches to feet — another PKASO/U exclusive.
- Instantaneous, single-command Lo Resolution Screen Snapshots, only from PKASO/U.
- Super Resolution — higher resolution graphics from your dot matrix printer than possible on the screen, only from PKASO/U.
- 4-way Rotation of image — 90°, 180°, 270°, 360° — positioned anywhere on the page.
- Direct or Reverse Printing — black on white or white on black.
- Full color for printers with color capability.
- 16-level gray scale for black and white photographic images, only from PKASO/U.
- Aspecting, with separate width and height adjustments for any size and aspect ratio.
- Windowing, the printout of any selected portion of a graphics image in any size — equal, enlarged or reduced, another PKASO/U exclusive.
- Low-cost clock/calendar option for time/date stamping, available soon.

Get Universal Compatibility with Current/Future Technology.

Link the Apple computer with any and all major parallel printers of today or tomorrow. Unlike other printing interfaces which are limited by ROMs or DIP switches with pre-set configurations, PKASO/U is completely configurable for either present or yet-to-come Centronics parallel-interfaced printers. Another only-from-PKASO/U feature.

Add ShuffleBuffer for a Complete Upgrade.

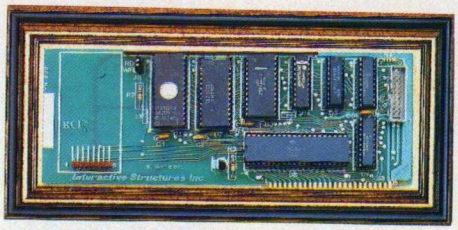
The new Buffer with a Brain, ShuffleBuffer, does the printer-feeding work of the Apple so the computer is free to perform other tasks. It's the only buffer that can rearrange stored data, mix and merge, repeat and reprint. Ask your dealer for a demonstration.

Pays for Itself with Color Ribbon Savings.

Exclusive Mosaic Mode suspends color dot overprinting operation, uses color dots printed next to each other (not on top of each other) to achieve the desired shade. And since fewer dots are printed, less ink is used, ribbon life is doubled and the PKASO/U pays for itself in ribbons saved.

Do it with PKASO/U.

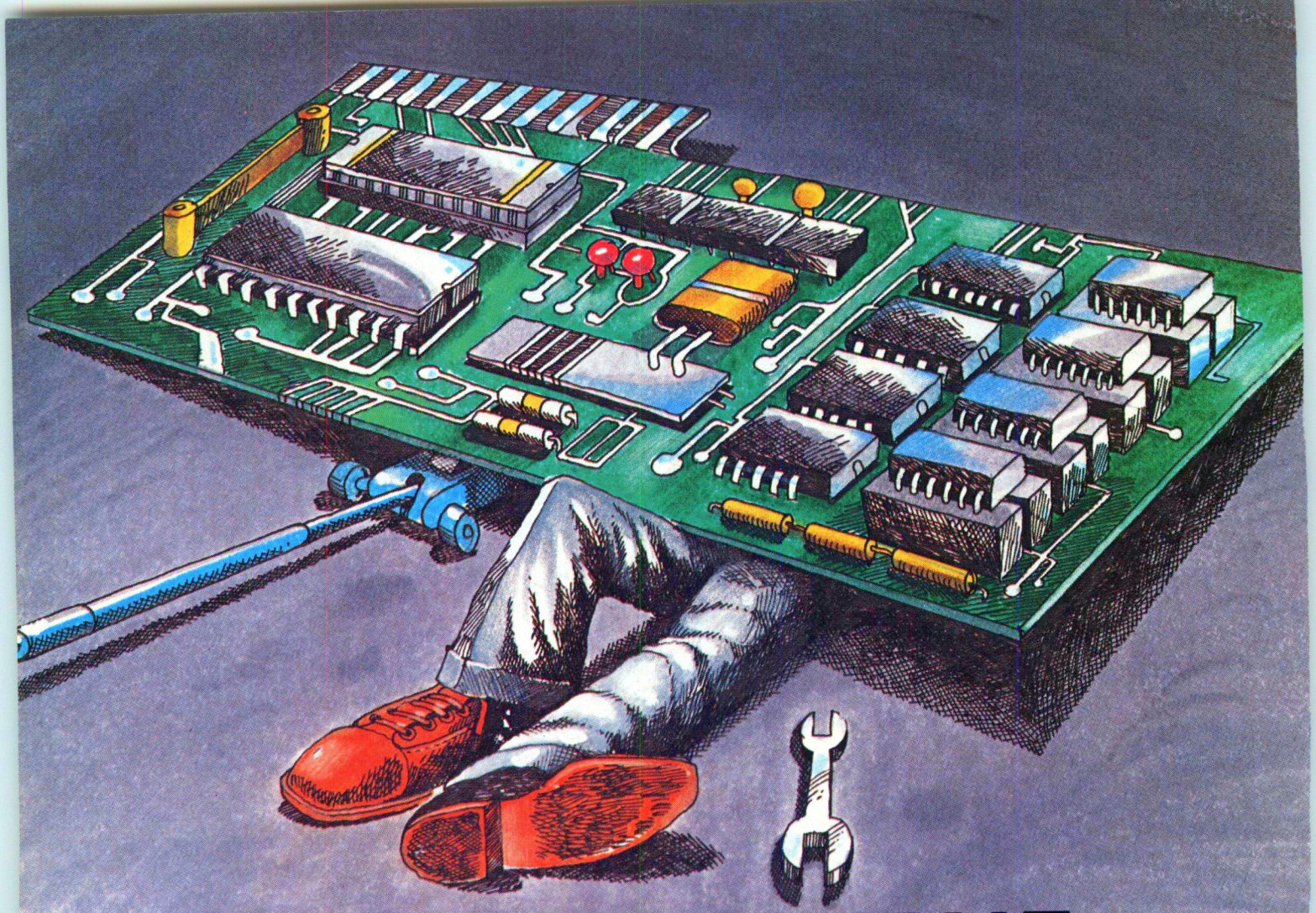
A fully-documented Demonstration Diskette and detailed User Manual make it easy; just plug in the cables (included) and start producing masterpieces. Explore the amazing capabilities of PKASO/U by visiting a nearby computer peripherals dealer. Or call us directly at (215) 667-1713 and we'll send you the details. Unframed.



PKASO/U DID IT.

Interactive Structures, Inc.
146 Montgomery Avenue
Bala Cynwyd, PA 19004
(215) 667-1713

CIRCLE 274 ON READER SERVICE CARD



WE SERVICE WHAT WE SELL,

PERIOD.

SLOTWARE™ BY
MICROTEK

Microtek, 4750 Viewridge Avenue, San Diego, CA 92123
Phone (619) 569-0900 or TLX 910-335-1269

CIRCLE 151 ON READER SERVICE CARD

data entry without making users look at the keypad.

All the manufacturers would do well to take a lesson from the wealth of information incorporated in designing good office calculators. A change as simple as using smaller key tops on the same switches would be an immediate improvement, since the space between the keys gives touch users a better feel and more certain finger placement.

A numeric keypad can definitely increase your productivity. All the units tested were clearly an improvement over the Apples' typewriter numbers for the entering of numerical data. How much you will gain depends on the suitability of your chosen keypad for your particular application. The person who will use it the most should "test drive" various units. It does little good for anyone to purchase an enhancement that ends up in a drawer somewhere because it's just not quite right. ✚

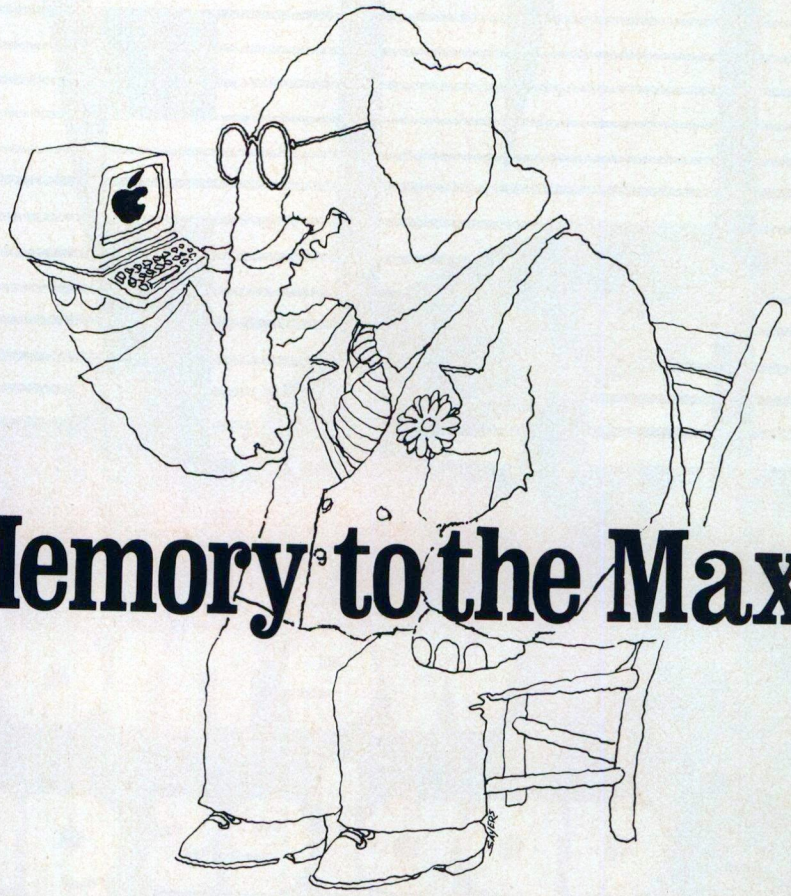
PRODUCT INFORMATION

ABT's The Keypad, Model B
Advanced Business Technology, Inc.
1180 Coleman Avenue
San Jose, CA 95110
(408) 275-9880
List Price: $125
Requires: Apple IIe or Apple II Plus with two-piece keyboard. For older Apples with a one-piece keyboard, use Model A.

JE614 Numeric Keypad for Apple IIe
Jameco Electronics
1355 Shoreway Road
Belmont, CA 94002
(415) 592-8097
List Price: $89.95
Requires: Apple IIe

KVA II Multi-Function Numeric Keypad
Omega Micro
215 West 1st, Suite 105-61
Tustin, CA 92680
(714) 730-1463
List Price: $199
Requires: Apple II or II Plus

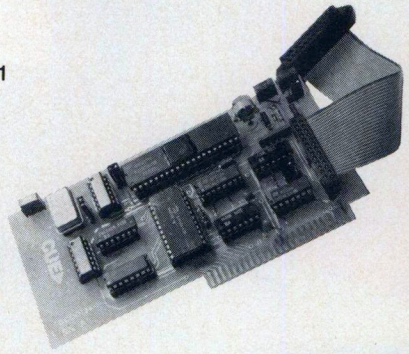
Numeric Keypad II
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 94015
(800) 538-9696 or
(800) 662-9238 in CA
List Price: $159.95
Requires: Apple II, II Plus and IIe



Memory to the Max

The DiscMaster II by Data Cue expands the storage of your Apple II or Apple II compatable systems. The DiscMaster allows you to connect two 8″ or two 3½ ″ double density disk drives per controller to your computer. The drivers are supplied for DOS 3.3 and PASCAL 1.1 operating systems. Optional drivers are available to read and write standard 8″ CP/M, IBM P.C., DEC P.C. and SUPERBRAIN disks.

The DiscMaster II is completely contained on a single Apple II compatible I/O board which can be installed in any one of six of the eight peripheral slots in the computer. The DiscMaster uses the latest technology in floppy disk controllers to give a price performance ratio unmatched in the industry.



Disk size for PASCAL and DOS

5″ SSDD	**164K**
5″ DSDD	**327K**
3½″ SONY	**286K**
3″ AMDEK	**164K**
8″ SSSD	**256K**
8″ SSDD	**512K**
8″ DSDD	**1024K**

Compatible with
Shugart 801/851
Shugart 801/851 compatible drives
Tandon 100
Tandon 100 compatible drives

DATA CUE
incorporated
5696 HIGHWAY 431 SOUTH
BROWNSBORO, AL 35741
(205) 883-2933

CIRCLE 264 ON READER SERVICE CARD

INFAX

We make apples grow!

The INFAX 101A now supports APPLE III, S.O.S. and APPLE II ProDos.

INTRODUCING THE INFAX 101A

The Infax 101A disk drive subsystem has been designed specifically for Apple* owners interested in added storage. Floppy disks are a thing of the past.

The Infax 101A features a removable 10 megabyte data cartridge. Your Apple* can have almost infinite storage capacity with the new Infax 101A.

Look at the features the Infax 101A offers:

- ★ Microprocessor-based error correction.
- ★ User transparent error detection and correction.
- ★ Automatic start-up diagnostics, idle drive shutdown, error recovery procedures.
- ★ Host adapter/controller and software supports up to 4 drives simultaneously.
- ★ Cartridge write protect switch.
- ★ Highest performance, reliability of any removable disk drive.
- ★ Lowest cost 10 megabyte (formatted) data cartridge.
- ★ More resistant to shock and vibration than any other fixed or removable disk drive.
- ★ Fastest start/stop (cartridge replacement) time of any high performance disk drive.
- ★ Non-contact head to disk interface.

The Infax 101A comes with disk drive, data cartridge, power supply, cables and personal computer adapter. Software included supports Apple* DOS 3.3, Pascal and CP/M.** Also included are support software for quick copying, backup and file management. Slot independent. Supports auto-boot capability.

Infax is a registered trademark of D² Products *Apple is a registered trademark of Apple Computer, Inc. **CP/M is a registered trademark of Digital Research, Inc.

Apple S.O.S. ProDos

INFAX®

For additional information and the name of the dealer nearest you call (800) 241-1119 – in Georgia call (404) 981-6778. Or write: VUFAX, INC., 5301 Covington Highway, Decatur, Georgia 30035

CIRCLE 135 ON READER SERVICE CARD

"Microsoft® Multiplan™ allows me to explore more alternatives in less time. I think it leads to better management decisions."

Edward R. Schwinn, Jr.
President, Schwinn Bicycle Company

"Multiplan software helps me make better business decisions. It's as simple as that. With Multiplan on my microcomputer, I can explore a number of alternatives faster. That's really important to me in planning and tracking my totally hand-crafted Schwinn Paramount Bicycle. As with anything handmade, cost control and product planning are major considerations. For instance, Multiplan lets me study the effect of the learning curve on overall productivity. And although we have a mainframe computer, I find that Multiplan is a tool that allows me to personally examine my business options—without spinning my wheels."

A tool for decision makers. Microsoft Multiplan is a microcomputer software program that can help you too. In many ways. You can analyze cash flow. Plan budgets. Forecast income. Manage production. Multiplan allows you to set up an electronic worksheet for whatever your need may be. And, it lets you explore alternatives faster because when you make one change you immediately see the results of that change throughout the worksheet and on any related worksheets. Just change one number and every number that depends on it is adjusted automatically.

In plain English. You won't have to learn a cryptic language to use Multiplan. It takes commands in plain English. And, it will prompt you as you go along by telling you what to do next. There's even a HELP key in case you need help at any point. Press it and it gives you information to get you going again.

See it in action. If you'd like to see Multiplan in action, and receive our latest brochure, call us toll-free:

1-800-426-9400
In Washington State call 206-828-8080

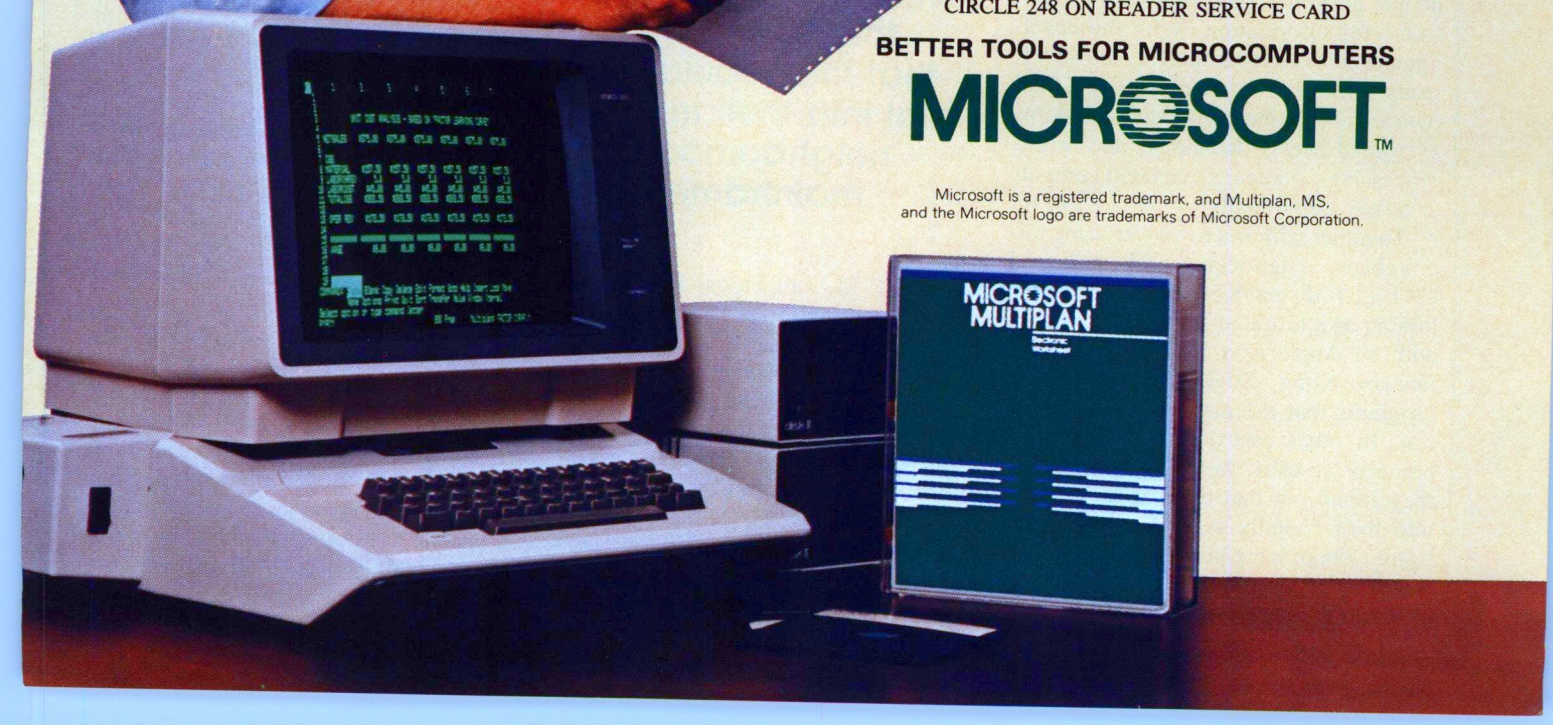
We'll gladly locate the Microsoft dealers nearest you. They'll demonstrate Microsoft Multiplan and explain its compatibility with most popular personal computers. Including Apple® and the IBM® PC. It's compatible, in fact, with any computers that use the CP/M®-80 or MS™-DOS operating systems. Microsoft Multiplan is a good management tool for building bicycles. It's also a good management tool for building businesses. Like yours.

CIRCLE 248 ON READER SERVICE CARD

BETTER TOOLS FOR MICROCOMPUTERS

MICROSOFT™

Microsoft is a registered trademark, and Multiplan, MS, and the Microsoft logo are trademarks of Microsoft Corporation.



DIAL A MAIN

Softerm Version 1.10
CRT Terminal Emulation for the Apple Computer
Softronics
6626 Prince Edward
Memphis, TN 38119
(901) 683-6850

Requires: Apple II, II Plus or IIe; 48K RAM; one disk drive; DOS 3.3; video monitor; asynchronous serial interface connecting to computer system or modem; 80-column board (optional); printer with serial or parallel interface (optional)

List Price: $150

Data-processing departments used to take care of all computer business with large mainframes. Except for some important executives or engineers, few people at home could dial into a mainframe for information. With the development of microcomputers, however, many executives started sneaking their own micros in the corporate back door, as spreadsheets, databases, and word-processing packages gave them computer power individually.

Together with micro-power came micro-chaos. High-tech execs had one CRT (TV display) on their desk functioning as a terminal for the mainframe, with an Apple next to it for VisiCalc, Donkey Kong, StickyBear, and other programs that the mainframe could not run. In other cases, Apple owners at home or at work were frustrated when they found out that they could not dial into their friendly neighborhood mainframe. There were some machines with which Apples simply would not communicate.

The Brave New World

To the rescue of corporate bigwigs and stay-at-home hackers comes Softerm, a CRT terminal-emulation program for the Apple II family of computers. This piece of software enables your Apple to function as a terminal for virtually any mainframe or minicomputer. It can streamline data entry by letting you transfer data from your Apple to a larger system and vice versa. It supports Apple DOS, CP/M, and Pascal formats, and you can even transfer files from a disk using one format in drive 1 to a disk using a different format in drive 2.

Apple owners at home or at work were frustrated when they found out that they could not dial into their friendly neighborhood mainframe.

Greetings, Dear Host

Softronics claims that the newest version of Softerm, Softerm 2, provides exact emulation of these terminals: IBM 3101 Models 1X (10,12,13); DEC VT100 and VT52; Data General D200 (compatible with D-100, 6052, 6053); Lear Siegler ADM-3A and ADM-5; Hazeltine 1400, 1410, 1500, and 1520; Honeywell VIP7205; ADDS Regent 20, 25, 40, and 60; ADDS Viewpoint; Datapoint 3601; and TeleVideo 910 and 925. The company is also willing to assist users of other terminals if possible.

An asynchronous serial interface is necessary to connect your Apple directly to another computer. Softerm supports the following interfaces: Apple Communications Interface Card; Apple Super Serial Interface Card; California Computer Systems 7710; Mountain Computer CPS Multifunction Card; SSM Microcomputer Products ASIO, APIO, AIO, and AIOII; Bit 3 Computer Dual-Comm Plus; Hayes Micromodem II and Smartmodem; Novation Apple-Cat II; and Intra Computer PSIO.

Softerm is written in 6502 assembly language for fast response time for screen displays and transfer of data. Softerm can operate at serial line speeds up to 9600 baud.

How It Works

For this review we used an Apple IIe and an Apple Super Serial Interface Card to emulate a Data General D200 terminal. We also used an Epson printer with a parallel interface. The Apple was connected to a Data General Eclipse C150 minicomputer by 100 feet of cable. Softerm was designed to work with a large assortment of host systems, but we hope that our particular experience is useful to Apple owners calling other systems.

Softerm uses two diskettes called the Program diskette and the Configuration diskette. The Program diskette contains a special version of the disk-operating system (DOS). The Configuration diskette is a data disk containing files neces-

FRAME

sary for each specific combination of hardware. You can copy both disks and add files to customize Softerm for your specific uses.

Terminal Setup

With a series of menus, the program allows you to specify the exact terminal and hardware configuration you want. The Setup mode lets you save your results to a file on the Configuration diskette. You can save as many different configurations as you need, depending on how many different systems you have access to.

First you have to give the program several pieces of information. You must select the filename for your configuration program, the terminal you want your Apple to emulate or look like, the serial interface, and the 40- or 80-column display. You also have to supply printer and modem information and enter the system parameters of the host computer.

Terminal Operation

After you set everything up, Softerm is ready to communicate with another computer. When you exit from the setup process, you are ready to sign on or dial the host computer of your choice. After you have logged on, you can perform a variety of keyboard functions and use disk and dial utilities.

You can create keyboard macros and load 18 at time to allow a defined character string to substitute as keyboard input. For example, the Control and K keys followed by a 9 can save you the trouble of entering your name and password.

The disk-utilities options that the program can execute while you are still signed on to the host include INIT (initialize), Catalog, Delete, Rename, Lock, Unlock, and Verify. A set of dialing utilities lets you enter, store, and print phonebooks of up to 43 phone numbers and can even initiate dialing.

Terminal Emulation

Obviously, the Apple IIe keyboard is not identical to that of a Data General D200 terminal or any other terminal that Softerm supports. If you use the Control key in conjunction with other keys, however, Softerm can let your Apple keyboard emulate most of the extra function keys it's missing. A few functions and templates are still missing, though.

Transferring files to the Apple IIe allows you to edit them with a familiar word processor such as Apple Writer IIe.

Templates are sturdy pieces of cardboard that fit neatly next to the unmarked function keys. With each different program, such as a word processor or a spreadsheet, you put on a template to explain the new set of tasks that the function keys perform when you use a specific program. Without templates, it would be difficult to move gracefully from one software package to the next.

Although Softerm does not give you the 15 extra function keys of the Data General terminal, it does allow the host computer to think that you have pressed them if you push the Control key and the F key followed by some other key. The program imitates other missing keys or functions in a similar fashion. Softerm comes with a list of how to imitate the function keys on all supported terminals.

File Transfer

You can transfer files in both the Local and Line Transfer modes. Local file transfer lets Softerm function as a file-utility program that recognizes type B (binary) and T (text) while maintaining communications with a host computer system.

The Line Transfer mode transfers files to and from the host computer and microcomputer. Transferring files to the Apple IIe allows you to edit them with a familiar word processor such as Apple Writer IIe. You can also choose to write a program that can use the files you've transferred.

We needed some data files that were collected on Apples in various locations and sent to us for file transfer to the Data General system. We used them to produce reports that the Data General sorted and formatted. Finally a 300-line-per-minute Data General printer printed them out.

People who use their computer at home can use this feature to capture data files or programs that normally appear only on the screen. You can print files as they pass through the Apple to your printer if all you need is a printed copy rather than a disk file.

REACH OUT TO YOUR BEST PROSPECTS FOR LESS!

Whether you're a retailer, manufacturer, dealer or distributor, you need fresh microcomputer mail-order prospects on a regular basis, month after month. And you can have them at reasonable cost—when you place a classified ad and/or directory listing in the specialty publications below.

A+ ▪ Computers & Electronics ▪ Creative Computing ▪ Digital Review ▪ Microsystems ▪ PC ▪ PC Tech Journal ▪ SYNC

Pinpoint the microcomputer mail-order market you want with a combination of our magazines!

High quality editorial environment, long shelf life and pass-along readership spell top-notch response! Phone us now for rates, sizes, and ad options by title, and insert your ad in time for the next issue!

Classified Advertising
ZIFF-DAVIS PUBLISHING COMPANY
Consumer Computers & Electronics Magazine Division

CALL 725-4215

Using Softerm can save you money and can give your Apple a dual personality. If you are used to working with a terminal, though, you must be able to adapt to the loss of your special function keys and trusted templates. Perhaps the kindly data-processing department of your company will help you make new ones. On occasion our system seemed to hang up, but the Reset key seemed to bring it back to life.

The program performs well for entering programs in BASIC and for data entry with previously written programs. With the word-processing software on the Data General (CEO), we found that the lack of function keys made for a few surprises, and we lost a few paragraphs before we got the hang of it. This type of emulation is definitely for experienced users of the systems in question.

Using Softerm can save you money and can give your Apple a dual personality.

A Child Shall Lead Us

We gave the task of making Softerm work with the Data General to one of our best tenth-grade students. His experience with computers included both programming classes and part-time programming work. By carefully following the comprehensive Softerm manual and asking for occasional help, he was able to make the Apple emulate a D200 terminal. With more hard work and some support from Softronics, he also mastered the process of file transfer.

After he had taken files in both directions, we gave him the task of writing a set of instructions that would spare us from the challenge of working through the file-transfer section of the manual.

Turning your Apple into a terminal is now possible, but we would not advise that you buy an Apple today and try to transform it into a terminal tomorrow. If you need to emulate a terminal, you will require either some technical background or help. Such help is usually available from the data-processing department to whose computer you want to connect, and also from the people at Softronics.

All the Instructions You Need

Although we've reviewed how Softerm works with Data General equipment, the program's manual contains detailed accounts for other terminal emulations. The Softerm User's Guide is 340 pages of well-organized reference material. You can read pertinent sections that tell you how to use the program for your configuration—skip the parts that discuss other terminals.

The users' guide includes an introduction to the product and sections on terminal setup; terminal operation; file transfer; terminal emulation, including how supported terminals work, how to use supported serial- and parallel-interface cards, and how to use 80-column video boards; and the ASCII character set. You'll also find a list of error messages, information on user support, a glossary, an index, and an addendum of additional information. The manual contains a great deal of technical information.

Will They Help Me?

Softronics offers extensive user support. If you cannot solve a problem by using the manual or by contacting your dealer, you can write or call for technical support. An on-line update service, included on the Configuration diskette, contains new information solutions to user-reported problems.

The product comes with a limited warranty for registered users that provides them with a free replacement for damaged disks and announcements of updates or new products. After 90 days and within one year of purchase, replacements will cost $15.

If you purchased the original Softerm product, as we did, you can upgrade it to Softerm 2 for $50. A less expensive version called Softerm 1 is available for $135 for users who anticipate connecting only to systems that expect Apples to be calling. Examples of these are The Source, CompuServe, and the Dow Jones News/Retrieval system.

The lack of function keys made for a few surprises.

The Way It Will Be

If you have time and patience, you can save money with Softerm. We strongly recommend this product to any organization that has Apples as well as a larger system that needs terminals. If you use your computer at home, it can give your Apple much more flexibility, but if you use your terminal mostly for programs that rely heavily on function keys and templates, be prepared for at least some initial frustration. ✚

What to do if you outgrow pfs: FILE, dBASE II, or VisiFile:

Introducing DB Master Version Four.

(Or how to make sure you never even have the problem).

Make the smart choice.

Get a system smart enough to grow with you. So you don't have to worry about outgrowing it.

Unlike virtually every other 'data base' package, DB Master Version Four™ is so organized, it handles its own expansion. Up to 200,000 documents, on as many as 100 diskettes automatically.

dBASE II,™ VisiFile,™ or pfs®:FILE can grow to only one data diskette.

(We offer similar capacity advantages if you use a hard disk.)

So if you've outgrown your system, there's relief. **Because you can convert your information from pfs:FILE, or VisiFile to DB Master™ files without retyping.**

Now you're ready to work with real information management software.

Information management. Easier to use by far than a data base language. More powerful by far than a 'personal filing system.'

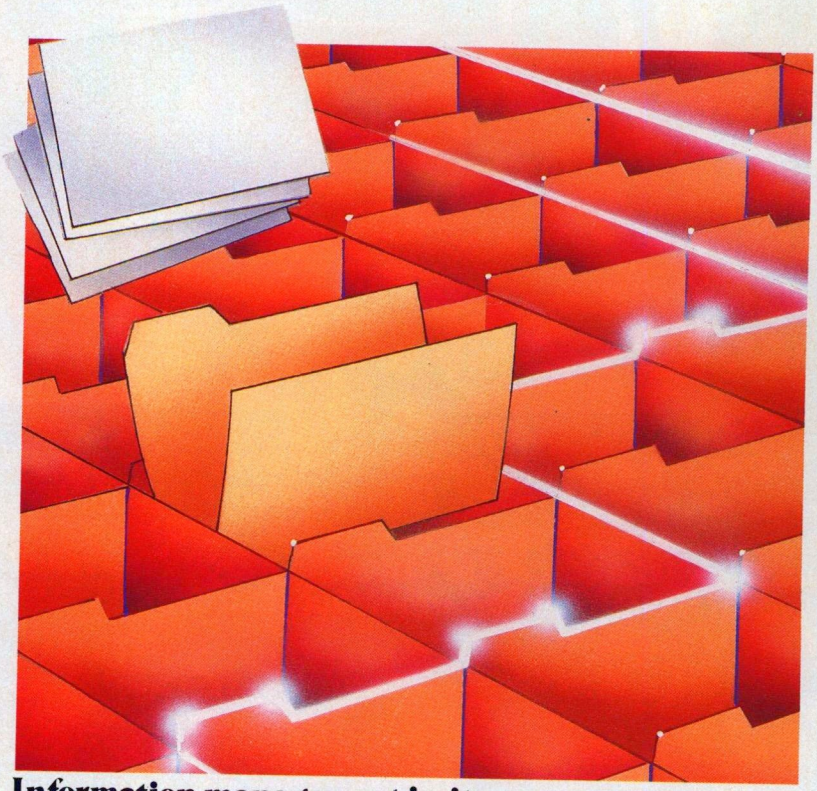
You want to manage files, not write software. (Look at what you have to go through to use dBASE II, for example— a 'data base' system).

And you don't want a 'toy' system that sacrifices power in exchange for 'ease of use.'

With over 35,000 systems installed, including literally every Fortune 100 company, tens of thousands of small businesses, professional firms, schools and colleges, scientific, government, service and agricultural organizations, DB Master is now managing literally BILLIONS of records for users worldwide.

Impeccable credentials.

Find out what those 35,000 DB Master users already know: we have a better way to look at information management. (It's all just a matter of having the right perspective.)



Information management in its proper perspective.

STONEWARE

Stoneware Incorporated, 50 Belvedere Street, San Rafael, CA 94901. (415) 454-6500 TELEX II: 910-384-2016 STONEWARE SRFL

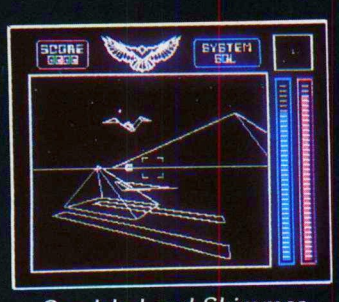
Registered Trademarks: pfs: Software Publishing Corporation **Trademarks:** dBASE II: Ashton-Tate; VisiFile: VisiCorp; DB Master, DB Master Version Four: DB Master Associates

CIRCLE 284 ON READER SERVICE CARD

STELLAR 7™

by Damon Slye

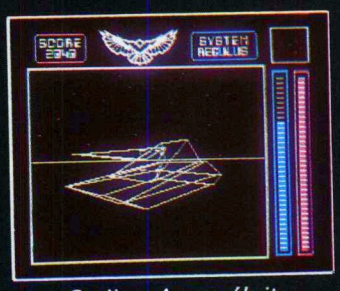
RAVEN, an experimental Agrav Unit, is Earth's only defense against the Imperial Arcturan Armada. Commanding RAVEN, you will face Arcturan laser tanks, pulsars, sandsleds, assault batteries, prowlers, skimmers, seekers, guise mines, and the rest of the rampaging Arcturan assault. Your wits and RAVEN's biphasal thunder cannon are all that stand between a helpless Earth and the wrath of the Arcturan Armada.



Sandsled and Skimmer

SOFTWARE ENTERTAINMENT COMPANY introduces ***STELLAR 7***, the ultimate 3-D strategy arcade game by Damon Slye. ***STELLAR 7*** features smooth HI-RES animation, a colorful instrument panel, and 7 unique levels, each more challenging than the last.

For ordering send $34.95 plus $2.00 shipping and handling to: SEC, P.O. Box 10854, Eugene, Oregon 97440. (503) 342-3495
Dealer inquiries invited.



Stalker Agrav Unit

Requires Apple II, II plus, or IIe • Apple II is a trademark of Apple Computer, Inc. • copyright 1983 SOFTWARE ENTERTAINMENT COMPANY

CIRCLE 133 ON READER SERVICE CARD

CHOPLIFTER!

Broderbund Software, Inc.
Entertainment Software Division
1938 Fourth Street
San Rafael, CA 94901
(415) 479-1170
List Price: $34.95
Requires: 48K RAM, one disk drive

CIRCLE 500 ON READER SERVICE CARD

Choplifter! from Broderbund Software isn't the usual chase-'em-and-kill-'em game; it's a helicopter with a mission to rescue hostages. You're in the pilot's seat with a chance to become a hero. But given the odds here, this game would probably appeal more to the Ayatollah Khomeini than to Jimmy Carter.

The object of Choplifter! is to retrieve 64 captives locked into the four 16-person barracks in the land of Bungelings and bring them home to safety. To do so, you must land your copter close to the hostages, give them time to climb in, and then lift off into the air and touch down on the landing pad, where the captives can scramble out to home base. It sounds simple enough, but, as you've probably guessed by now, Bungeling land isn't too friendly a place. As you play, you'll encounter your enemy's weapons, which make your mission so difficult.

Getting Started

To begin play, insert the Choplifter! diskette into the drive and press Return. Your screen displays a moonlit sky with twinkling stars and a helicopter flying randomly across the horizon. Below, in the left-hand corner of your screen, is a post office flying an American flag signifying your home-base landing pad. As you watch the monitor, the ground moves to the right, away from the safety of home base and into Bungeling land, where you catch your first glimpse of the hostages frantically scurrying along the ground trying to wave down the helicopter.

Once the program has run through this introductory scenario, press any key to begin play. You control the helicopter using a joystick with two buttons. Move the stick up, down, left, and right, and it will respond logically. Pressing button 1 faces your copter forward, and button 0 lets you fire.

Each game of Choplifter! is divided into three rounds called "sorties"; each sortie provides you with a new helicopter, giving you another chance to make your great escape. Each round becomes progressively more difficult as the Bungelings get angrier at you and seek revenge.

In the first sortie, though, they aren't too unkind; you'll discover that they have given you a head start by bombing open one of the barracks and releasing the first 16 captives. (Perhaps kindness isn't an accurate explanation here; it seems more likely that you've caught the Bungelings off guard, giving some of their captives a night out on the town.)

You catch your first glimpse of the hostages frantically scurrying along the ground trying to wave down the helicopter.

The title "First Sortie" flashes on your monitor, the sound beeps on, and a barrack full of hostages runs free along the ground. As you peer down at them from your helicopter, you spot your enemy. Start planning your strategy, quick! The Bungelings have three weapons at their disposal: tanks, jet fighters, and drone air mines. Tanks amble along the ground knocking hostages or helicopters dead in their paths. So think fast; those Bungeling tanksters are nasty. Press button 1 on your joystick to face your copter forward and maneuver it into position. Press button 2 to shoot. Now it's safe to swoop down and land so the hostages can board your vehicle. But be careful; if you hit a hostage in the process of landing, you'll kill him, and you certainly won't make a hero of yourself that way!

The hostages that manage to board the chopper are grateful. They appear to be smiling in a naive sort of way, as if they were embarking on a joyride rather than a rescue mission. The chopper has a seating capacity of 16, so technically you could take the whole barrack at once, but the tanks will attack before this happens. You have to interrupt the boarding of the hostages with intermittent lift-offs and relandings in

an effort to avoid your attackers, and you're certain to experience many casualties.

You can't afford to waste time dwelling on them, because you have three more barracks-full to rescue. Blow open a barrack and 16 more captives will run free. To do so, turn your copter sideways and go on a strafing run. A direct hit will blow the barrack open. Note that all 16 hostages in each barrack

The scenario is so unvaried that after a while you may find yourself wishing for new terrain.

must be rescued or killed before you can go on to the next one. On your first venture, the best strategy is to take a full load of captives to home base, because once you've accomplished your first rescue, the Bungelings realize what's going on and go wild with revenge. At this point the game becomes considerably more difficult.

Mission Partly Accomplished

On your next foray, they'll get you with their other two weapons, the planes and the drone air mines. The planes scream out of the sky, attacking you and the hostages, but the drone air mines are the deadliest weapons. They seek out your copter and blow it up on contact. They can even sneak up on you at the landing pad.

A sortie ends when your copter is blown up or crashes, and, considering the number of foes that are out to get you, sometimes this doesn't take very long, especially if you are new to the game. The second sortie is a repeat of the first, at an even more frenetic pace—ditto the third—and while you are busy avoiding all these killers in the air, tanks are knocking off defenseless hostages by the handful. The third sortie of Choplifter! redefines the term *acceptable casualties*. The game ends when all the hostages are dead or rescued, or when you lose your third helicopter.

Waving Goodbye

Your score appears at all times at the top of the screen, in three separate capsules, which the game's instructions call "lemons." (I played the game on a monochrome monitor, but the instructions explain that these lemons are red, blue, and green on a color monitor.) The capsule on the left shows how many hostages have been killed; the one in the middle tells you how many captives are inside the chopper, and the third gives your score, a count of the number of hostages you have returned safely to home base. The maximum score is 64, for the total number of hostages. The first two scoring categories are particularly useful, because the game moves so fast that you often kill or rescue a hostage without realizing it. Some of the hostage deaths appear to be random; you may not have seen them actually being hit. I suspect these deaths are caused by the copter, though. They may have something to do with the angle at which your helicopter lands.

One of the most appealing things about Choplifter! is its graphics. The captives are cute, if not a little pathetic. They wave you down for rescue, and they wave goodbye as they disembark at the landing pad. The twinkling stars are a nice touch, too. On the other hand, the scenario is so unvaried that after a while you may find yourself wishing for new terrain. The game's universe is finite, extending from the post office to just beyond the fourth barrack. When your chopper reaches the edges of the screen, it stops dead and has to reverse direction. The helicopter can't exit and reenter the field of play, which would have been a nice touch.

The most outstanding feature of Choplifter! by far is the maneuverability of the helicopter. The joystick responds to even the slightest thrust, giving you remarkable control. Special keys offer some additional features. Pressing ESC pauses the game during play, Control-S toggles the sound on and off, and Control-V and Control-A reverse up/down and left/right on the joystick, respectively. One last complaint: Your chopper can achieve full speed only when it is flying forward, which is frustrating at times.

Choplifter! is an immediately accessible game—anyone can play it. But playing well is another matter entirely. You can't progress to the second level

Your chopper can achieve full speed only when it is flying forward, which is frustrating at times.

until you've rescued all 64 hostages, so, for mere mortals, Choplifter! is a one-level game. But with enough practice you can learn to outwit your enemies. Who knows? Maybe if Jimmy Carter had played this game . . .

Jennifer deJong

WITNESS

Infocom, Inc.
55 Wheeler St.
Cambridge, MA 02138
List Price: $49.95
Requires: 32K, Apple II, Apple II Plus, or Apple III in emulation mode, one 16-sector disk drive.

CIRCLE 501 ON READER SERVICE CARD

When I first saw The Witness, part of the Infocom Mystery Series, I knew I had to have it. The concept seemed perfect for a crime fiction buff such as myself. In the game, the player becomes a detective who sees a client murdered and spends the rest of the game struggling to find and arrest the killer.

With The Witness, I thought, I would finally be able to take all the lessons I had learned from years of reading detective mysteries and put them to practical use as a computer gumshoe.

After all, I'd been coached by the best—Sam Spade, Lord Peter Wimsey, Sherlock Holmes. This computer game, I thought, could do nothing but help make my sleuthing more sophisticated.

I was partly right. Playing The Witness did give me some suspenseful, funny moments. But the program also has some limitations that kept me from running as complete and realistic an investigation as I would have liked.

Clues

The Witness is attractively packaged and comes with a "police file packed to the gills with revealing evidence you'll need to unravel the crime." The file contains a mock 1938 newspaper with stories about the man whose life you are to protect, a telegram he sent you, a suicide note, and a matchbook. The *National Detective Gazette*, a well-produced game handbook, an Infocom reference card, and literature describing the company's other game offerings are also included.

To begin the game, you review the *Gazette*, load The Witness disk, and boot your system. Text appears on the screen and describes your situation and the characters around you. Suddenly, you are one of the characters in an interactive mystery novel.

As the story progresses, you are asked to take action often. According to the documentation, you have 12 hours to solve the mystery, but you don't have to do it in one sitting. You may suspend, restart, or quit the investigation at any time and print out a transcript of the investigation, if desired.

The object of the game is to gather enough evidence to warrant an arrest. When you arrest a suspect the game ends. Later you receive a letter from police department headquarters telling whether the suspect was indicted, and, if so, the outcome of the trial. There are many possible endings to the game.

Hide and Seek

The game gives you a fairly extensive command vocabulary for executing various detection procedures and talking to characters in imperative sentences. It was fun to search for, analyze, and confront suspects with physical evidence. Commands allowed me to follow, hide from, accuse, and arrest other people, and more. And watching other characters' reactions when I ordered them around—"Give me the note," "Show me the gun"—helped me begin to unravel their stories.

But I encountered problems when I began questioning characters in this electronic thriller. The limited questions I could ask and number of words the program could understand hindered, rather than helped, my investigation and made its outcome more dependent on how I handled physical evidence than how I questioned suspects.

You are presented with a situation suspicious enough to warrant thorough investigation. It is Friday, the end of another hard week, when an urgent telegram reaches you, chief detective with the Cabezaplana, California, Police Department. It is from Freeman Linder, a well-known Los Angeles businessman, whose wife shot herself only a week before. He is writing because he believes his wife's lover,

The object of the game is to gather enough evidence to warrant an arrest.

who blames Freeman for her suicide, is planning to kill him. He wants you to come to his house to protect him that night. It's a story line that would have made Ross MacDonald proud.

Once you arrive at the house, you meet Freeman; his daughter, Monica, who "gives you a look like you're a masher who just gave her a whistle"; Phong, the enigmatic Oriental butler; Stiles, the late Mrs. Linder's lover; and your assistant, Duffy.

Ambiguous Answers

The problem occurs not when you meet these characters, but when you try to communicate with them. The game's questioning options are too limited to make interrogation, the cornerstone of any good investigation, very effective.

The characters are believable, the story well written, and the concept great for armchair detectives.

I couldn't grill my suspects in this game. Witness characters will respond only to two kinds of requests: for information about someone or something, and for the whereabouts of someone or something. ("Linder, tell me about Stiles." "Monica, where is the cat?" "Phong, have you seen the scroll?") When you try to squeeze information out of the characters with these standardized questions, you realize how general they are.

The detective in *Witness* can never ask the question "Why?" This short question can get more information out of people than any other in our language. Ask the parent of any toddler. Yet the detective in *Witness* isn't allowed to use it. This gives the other characters in the game a certain advantage and presents you, as a gumshoe, with some rather sticky problems.

Circuitous Grilling

Instead of asking Stiles directly why he had an affair with Mrs. Linder, I had to approach the question indirectly by typing, "Stiles, tell me about Mrs. Linder," and hoping he would volunteer his motives. He didn't.

When I asked Phong to tell me about Linder and the butler said he would leave his employer and return to Asia in a minute if he had the money to travel, I couldn't ask why. When Monica said no one had understood her late mother better than herself, I could only sit there tongue-tied. I dropped hot leads so fast, it felt as if my hands were full of burning coals.

I also found it troublesome that the program doesn't recognize or let you use many of the words spoken by its characters or used in its descriptions and documentation. The *National Detective Gazette* does say that "the program uses many words in its descriptions that it cannot analyze." Limitations must be expected with any game, but the ones in *Witness* were more extensive than I expected.

For example, at the beginning of the mystery, Stiles sends Linder a threatening note, which reads:

> Linder—
> Since Virginia died, I've lost too much sleep because of you and your harassments. The time has come to put this matter to rest once and for all. I'll be seeing you sooner than you imagine.
>
> —Stiles

As the detective, it is your job to find out what this note means. After reading it, I immediately typed in "Linder, tell me about the harassments," and the program responded, "I don't know the word 'harassments.'" So I tried another tack and typed "Linder, tell me about the matter," only to have the program respond "You don't need to use the word 'matter' to solve this mystery." Since the program could not use two key words in the note, I could only ask Linder very general questions regarding the note and hope he would blurt out some useful information. He was too smart for that.

According to the newspaper I received as part of the game package, Linder ran an international import-export business "devoted to the exchange of goods between the U.S.A. and Asia." At one point, when Linder told me he'd met Phong in Asia, I asked him to tell me about Asia, only to have the program respond "I don't know the word 'Asia.'"

No News Useful News

Two of Linder's close associates, film star Gaunt Rockwood and businessman Yukio Matsuyama, were mentioned prominently in the newspaper article on Linder. When I asked Linder for information on these two characters, the program responded that neither name was recognized. My experience with the newspaper's lead article didn't encourage me to scour the others for leads.

The detective in Witness can never ask the question 'Why?'

I know that a program, no matter how well crafted, cannot accommodate every question I might ask, and I am not saying The Witness should. But I do think the program could have been designed to allow the detective to use more of the tantalizing information offered by the game's characters, descriptions, and documentation.

Although the game does have certain limitations, it is still quite appealing. The characters are believable, the story well written, and the concept great for armchair detectives eager for their own adventure after years of cheering on fictional friends. I have been lured back to the game three or four times to grapple with its sordid scenario and cryptic personalities. The Witness is not the perfect game for an aspiring gumshoe, but it's not a bad start. It has limits, but once you learn to play within them you can have a lot of fun chasing villains on your video screen.

Lindsay McGrath

PLANETMASTER

Magnetic Harvest
P.O. Box 255
Hopkins, SC 29061
Requires: 48K
List Price: $24.95

CIRCLE 502 ON READER SERVICE CARD

American poet Emily Dickinson once wrote, "If I can help one fleeting robin onto its nest again, I have not lived in vain." If only she had lived long enough to play Magnetic Harvest's Planetmaster. Then she could have helped save jofulls, grouxxes, wheepies, waferts, poiboles, leevers, and poodens.

There are no robins in Planetmaster, Emily, but there are bighens.

Planetmaster derives its name from the planetmasters, who act as shepherds of the Intergalactic Greenpeace Foundation in the year 2323. Their mission is to save the animals, much as the current "Save the Seals" and "Save the Whales" organizations attempt to do.

It can give you the feeling that you do make a difference in preserving an environment.

The game requires players to select six endangered species from a seemingly unlimited number of animals and then transport them en masse to a Space Sanctuary Satellite (SSS) for the purpose of preserving and nurturing them.

SSS's are dodecahedronal structures 48 kilometers in diameter. The satellites are segregated into 12 zones, each exhibiting a unique climate. During the four seasons of 30 days each, weather conditions vary as much as 25% from the zone norms.

Whether a species, whose biological characteristics and needs differ from those of other species, lives or dies, depends on the climate you select. A player must also take into account the unpredictable weather conditions; varying geography; several different types of genetically engineered, regenerating food vegetation; birth and death rates; food consumption; and hibernation periods.

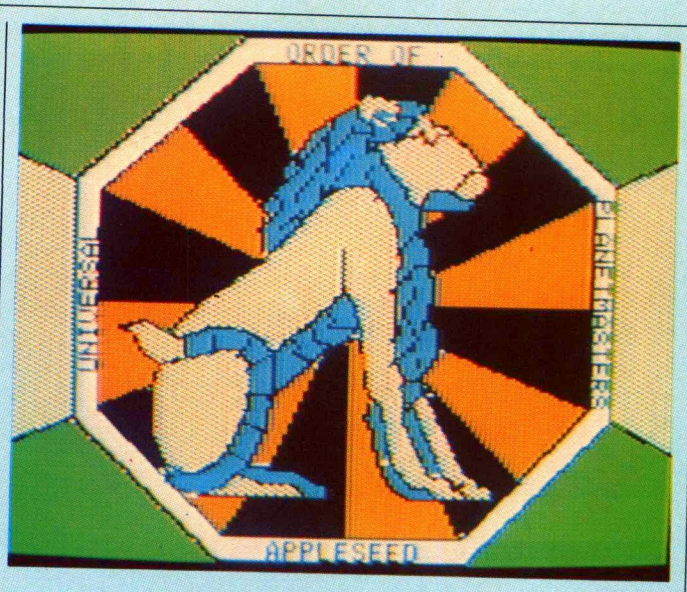
Whew! It's quite a bit of information to remember, but if you overlook even one aspect or make one incorrect calculation or guess, it could mean extinction for an entire species.

After analyzing these important factors, you must herd the animals to different zones, choosing among zones offered. It is best to jot down the animals' characteristics and compare them with the various climates. The game is completed when you've successfully transported the six species for the number of years you previously selected.

With each season you get an efficiency rating of your performance. You have to achieve an overall rating of 85% in order to receive a "certificate," not much of an award for the amount of time and energy put into transporting the six species.

Playing Planetmaster is not an easy task, and therefore you should begin with one year (with four seasons and six species, which amounts to 24 transports) to get a feel for the game. You can choose from five levels of play—novice planettender, journeyman planetkeeper, professional planetkeeper, advanced planetologist, and planetmaster.

Accompanying the software is an instruction booklet, an absolute necessity. In addition to definitions, the booklet contains appendices with climate conditions, maps, plant-growth characteristics, possible range of species biological descriptions, and miscellaneous program information. All player inputs and options are defined on the 50 game screens, but it helps to take notes during game play.



Players seeking elaborate graphics will not find them in Planetmaster. The only graphics are the species, which all look the same; bar graphs; and the "certificate"—all uninteresting.

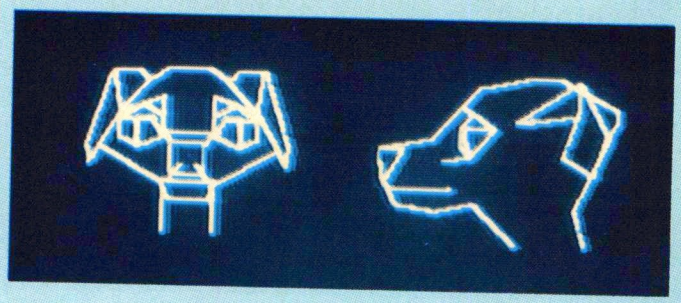
The game is an educational tool, designed to inculcate higher human and cultural values.

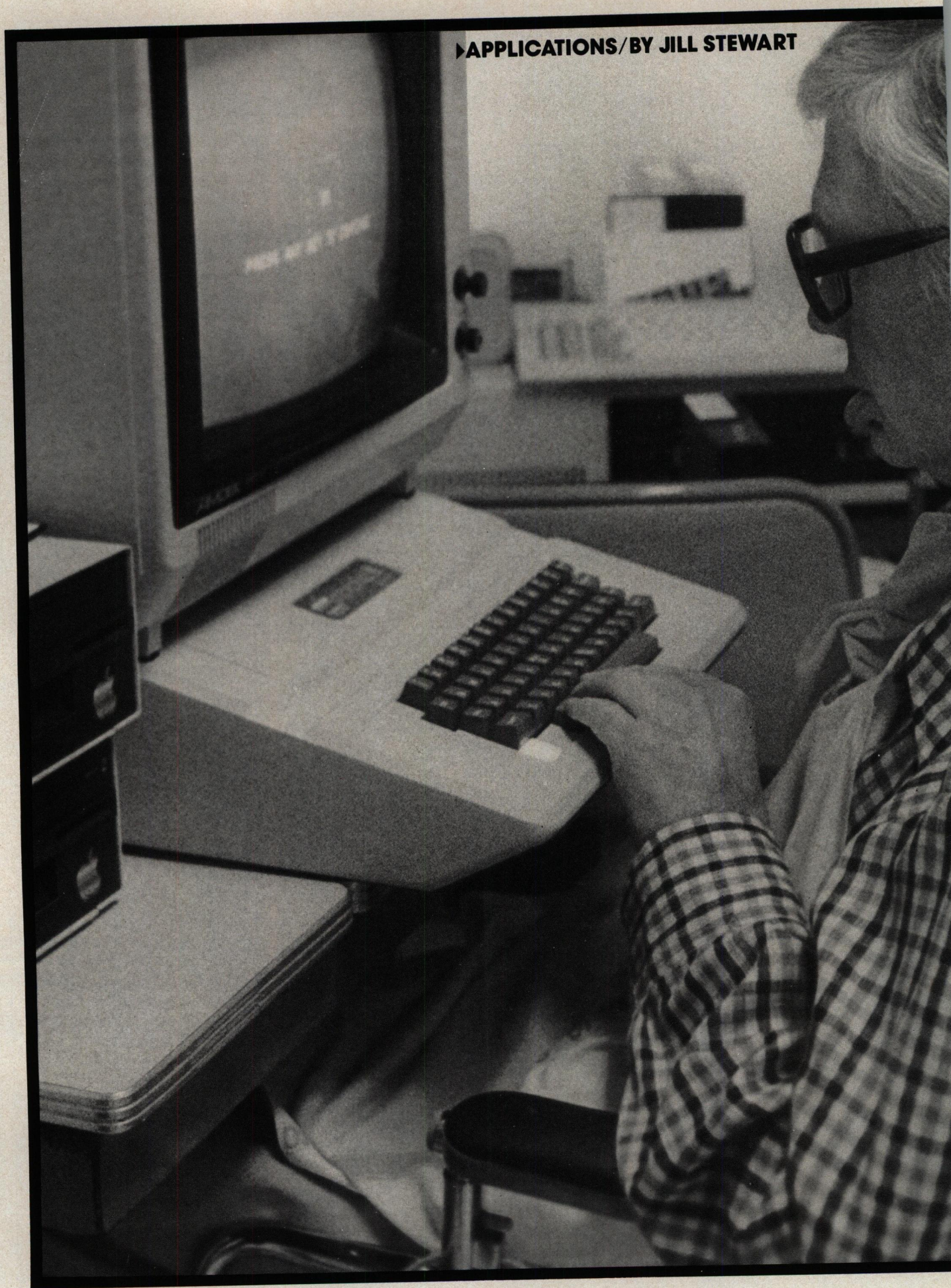
Graphically, Planetmaster lacks the creativity and complexity of other new software, but the game does possess a unique quality: it works on the mind and feelings. In this sense, the game is an educational tool, designed to inculcate higher human and cultural values. It makes you employ your intellect and intuition, for Planetmaster relies on chance and skill.

Other features of the game include a copyable program, game replay, player history recall, a one-key menu, specific variable definitions, and key program algorithms to permit experimentation with simulation parameters. What it does not feature, however, is the excitement associated with winning or losing.

As a "game," Planetmaster fails; as an educational tool, it fulfills its purpose. It sets out to challenge the user intellectually and humanistically. If it cannot provide visual diversion, it can give you the feeling that you do make a difference in preserving an environment.

Nell Fields





BRIGHT SCREENS BRIGHT HOPES

How one man is recovering from a devastating stroke with the help of his family, friends, and an Apple computer.

Imagine that a damaged human brain, now void of its information-transmitting grooves, could be repatterned with the help of a computer.

The newly handicapped person, whether a victim of a stroke or an accident, would be forced to pave the data avenues in his brain repeatedly following computer programs designed specifically for brain-trauma patients. Through this seemingly tedious yet innovative process, the lost abilities such as memory, speech, and touch could be relearned or restored so the accident victim could resume a more nearly normal life.

That is the hope of medical and technical experts throughout the country who are pioneering these new concepts. And it's the hope of victims, such as Lionel Mosing, a once-brilliant industrial psychologist who suffered a near-fatal stroke almost two years ago. The stroke critically damaged his left frontal lobe, where the brain's speech center is located, and rendered him aphasiac—a medical condition characterized by the inability to speak or completely understand the spoken or written language—and unable to walk and perform such vital tasks as eating.

"Lionel had the most severe, massive stroke that a person could have and survive," said Darlene Hornbeck, rehabilitation coordinator at St. Mary's Medical Center in Long Beach, California, where Mosing is the focus of a highly experimental therapy program.

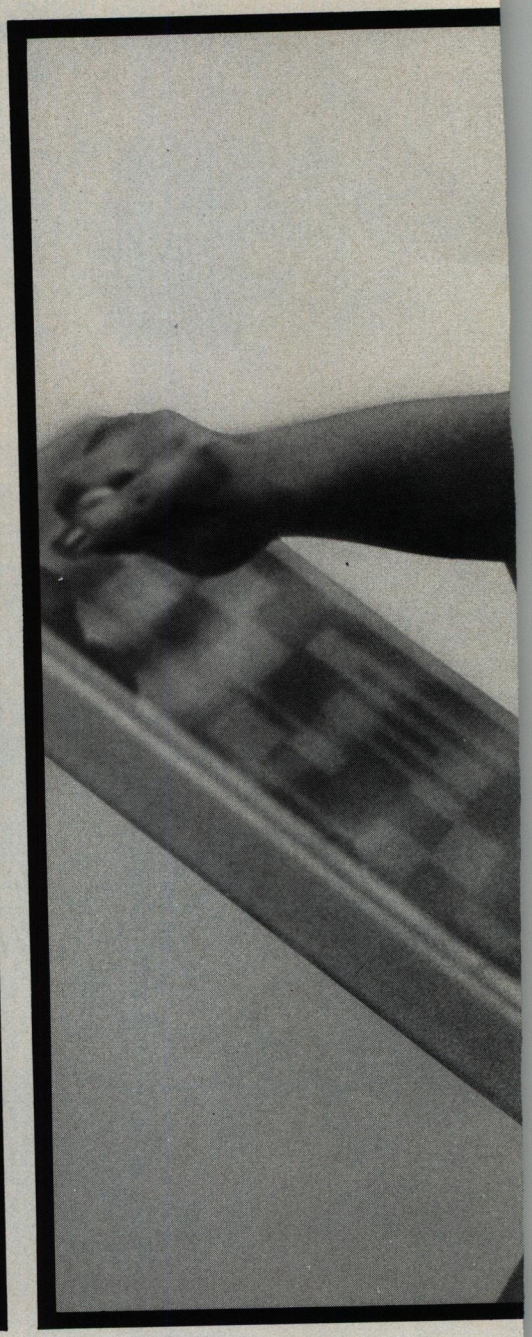
The six-member medical team has introduced the computer rehabilitation into Mosing's daily regimen in an attempt to stimulate his broken thought patterns.

Tony Villano, a former colleague of Mosing, has joined the team to help his crippled friend and has taken a special leave from his job at Xerox Corp. He uses an Apple II Plus computer with an Amdek Color I monitor as part of the program.

"Lionel was always the computer man who said, 'Hey, this won't work with a human being,'" Villano explained. "It's funny, but now I'm figuring out what will work and what will not work with Lionel."

Ended Illustrious Career

Before Mosing's stroke, he was a top computer interface designer for Xerox Corp. in El Segundo, California. Earlier, he was one of the key developers of the Bell Telephone Trimline phone. He also holds eight patents and a doctorate



in industrial psychology.

The stroke in the left side of his brain resulted in paralysis of the right side of his body.

"It's as if you were taken away and plopped down in China without any way to understand Chinese or to make people understand you," explained Dr. Hubert Gulak, director of rehabilitation at St. Mary's, of Mosing's condition.

Through his trial-and-error therapy program, Mosing is being given the chance that many people don't get but should, explained Dr. Gulak, who also works with the team. "Medicare and most insurance plans would never give us the time we need to bring them around. People trapped like Lionel just get shuffled off."

When Mosing was transferred to St. Mary's from a small Orange County hospital in January 1982, Gulak said he was taking on a patient otherwise destined for a nursing home. On January 14 of that year, the daily hospital report noted that Mosing "could not open his mouth with cueing and could not follow a voice in the room. No awareness of pinching." Today, the once-slim hospital report is a nine-inch thick document full of small miracles.

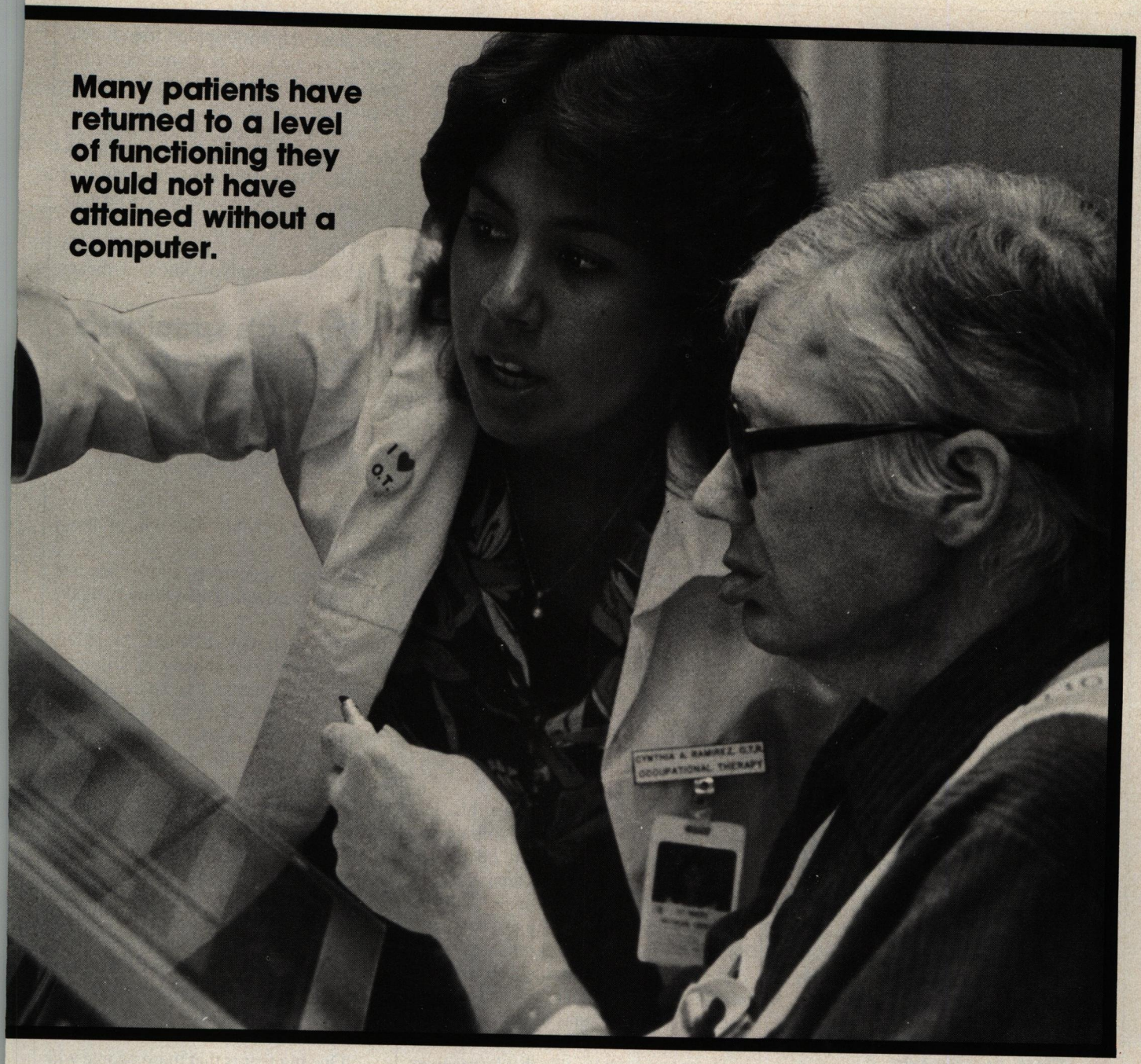
Computer Therapy in Demand

Success stories such as Mosing's naturally have spurred the growth of this fledging field of using computers for brain-damaged victims. The new therapy also has gained popularity because of the increasing numbers of victims who survive incidents that would have killed them a few years ago.

"Survivability is creating a new population," explained Richard Friswell, executive director of the National Head Injury Foundation in Framingham, Massachusetts. "The neurosurgeon preserves the quantity of life, and preserving the quality of those lives is falling to the rest of us."

Friswell estimated that this year about 50,000 people will survive accidents, whereas 10 years ago the number was 20,000. More will live, he said, largely because of advances in emergency room techniques.

At the forefront of this computer therapy is New York University Medical Center's program for stroke and head-



trauma rehabilitation. Its program has shown remarkable success and has spurred interest in the process.

Of the 70 people treated at NYU using computers, only about 5 percent showed no progress at all, while 10 percent returned to their former jobs. The rest hold jobs at sheltered workshops or engage in routine daily activities. With this success rate has come non-stop inquiries, according to Jack Rattock, clinical neuropsychologist at the hospital's Rusk Institute. What the callers want to know is how Apple and Radio Shack microcomputers help restore the concentration and attention span of patients.

The Community Hospital in Indianapolis, Indiana, has compiled an impressive success rate also since it began computer therapy in 1981.

"Many, many of them [the patients] have returned to a level of functioning they would not have attained without a computer," said Dr. Lance Trexler, who is the program's director.

Calling it a quality-of-life issue, Dr. Trexler predicted that the use of computers to re-educate the brain will sweep every rehabilitation ward in the country in a matter of years.

In Los Angeles, Dr. Richard Katz, coordinator of speech pathology at the Veteran's Administration outpatient clinic, is working with a dozen brain-damaged veterans to improve their reading comprehension and math aptitude. He is using Apple computers also.

"We've found that guys who used to come into the clinic for therapy two or three times a week are coming in all the time now," he said. The happy result, he explained, is dramatic improvement in both their ability to recognize words and to communicate.

He added: "Our patients respond to computers just like everyone else—they're excited."

Custom-Rehab

Since the therapy is so new and so individualized, rehabilitation programs vary from patient to patient. The program devised for Mosing, for instance, includes a combination of traditional therapy such as problem solving with colored blocks, table-top word and number games and physical exercises with

his nonparalyzed left side, and several computer games.

For his computer therapy, two programs written in the language BASIC are used.

Occupational therapist Gary Bedell selected the two programs and Villano has found others. Bedell's programs were written by David B. Waechter as part of a brain trauma rehabilitation program at Coastline College in Orange County, California.

Villano also scoured the country in search of appropriate computer programs. He also sought out three other victims of brain trauma who could benefit from computer therapy. He wanted patients who had deficiencies distinct from one another, who needed to relearn different tasks.

In one of the games, called Shape Same, the object is to match the appropriate quadrant with the identical shape in the center. This is accomplished by pushing one of four keys on the keyboard.

What the patient sees on the monitor is a screen split into four empty quadrants with a small fifth section in the center. A brightly colored shape—which looks like a jigsaw puzzle piece, except it has no curving angles—appears in the center section. Each quadrant contains five odd shapes, all similar to the center's configuration.

The other program, called Shapes Different, works on the same principle but with a variation. The four quadrants contain the same shapes as the center and only one shape is different in one of the quadrants. Again, the patient must identify the correct quadrant by pushing a button.

'Our patients respond to computers just like everyone else—they're excited.'

"With all of these programs, we are trying to improve the variety of unfamiliar things Lionel is able to do," Bedell said. "Shape Same forces him to use all four visual quadrants and to enhance his initiation behavior and motor planning. Reaction Time forces him to concentrate enough to move his hand and stop the numbers from counting."

Mosing's team is betting that introducing the computer to his therapy will help snap him out of an unusually long poststroke period.

Progress and Hope

Dr. Gulak said he is now convinced that Mosing's intelligence is intact, locked in behind the blue eyes that twinkle when he smiles and that dart swiftly from face to face when he is frustrated.

"I've gone to Lionel many times in the last year . . . and I've just touched him on the shoulder and said, 'It's going to be OK,' " Dr. Gulak said. "And I think, somehow, he knows what I am saying.

"He is a very intellectual man who realizes his plight and, because of his intelligence, isn't happy about trusting a lot of people," he added.

In May, a few days after Mosing's 53rd birthday, he had a breakthrough in his ability to think in sequence. He completed a simple task of subtraction, which requires use of his short-term memory.

"At each point during the task, I said, 'My gosh, Lionel, do you realize what you've done?' and he nodded his head," said Joyce Block, his speech therapist. "Then I said, 'Did you think you could do it?' and he shook his head no.

"Because he's such an intellectual person, he was very quiet about it," she said. "Tears came to my eyes, not to his."

Today, Mosing can move his left hand and arm to use the computer or warmly shake a hand. But he is still unable to move most of his nonparalyzed left side without help. He can "walk" a short distance between support bars, and he has learned to control his facial muscles so that his lips do not slack. He can nod his head to indicate yes and no, and uses facial expressions to communicate. But his lips can rarely form words, and eating is so much trouble that he receives food through a tube to his stomach.

Known as apraxia, the inability to move nonparalyzed muscles is common among stroke victims and takes time to overcome. For instance, Block explained, Mosing is faced with reactivating the 30 to 40 muscles needed to swallow. He has relearned two words: "yes," and "why."

"Personally, I wish he could cry or laugh and get it all out of him," said his wife, Lois, a sixth-grade teacher. "It's very atypical of him to be this nice, passive guy all the time. I am frustrated for him for that reason."

There are times, too, that others sense Mosing is comprehending what's going on. One of these moments occurred when Villano explained to Mosing his plan to take a social service leave from Xerox and help his crippled friend recuperate. Such a leave is sponsored by the corporation under a year-long community program.

When Villano told Mosing about the idea, "His first reaction was this quizzical look. Then, after I talked about it at different times, he would always take me by the hand and shake it.

"There are times he squeezes your hand so hard that you know it means something, and this was one of those times."

Mosing's specialists admit they are ready to try anything involving computers.

Mosing's specialists admit they are ready to try anything involving computers.

"This is all play-it-by-ear," said Dr. Gulak. "We have nobody to follow in dealing with aphasia, but we have a definite idea where we're trying to go."

According to William Steinberg, the computer adds a novelty that can help both patient and therapist overcome the drudgery of rehabilitation. A computer also can present the same tasks over and over without variation, and can rate the patient's progress objectively. Steinberg, a staff psychologist, works with the St. Mary's medical team.

No Cure-all

However, Dr. Gulak and other specialists warn that computers should not be viewed as a panacea for brain-damaged patients.

"One big fear is that these people will only learn to push buttons right, and nothing else," said Dr. Katz.

But all of this is academic to Lionel Mosing.

Recently, he left the hospital for the second time in nearly two years to attend the graduation party of his daughter, Lisa, who received a master's degree in nutritional science from California State University/Long Beach.

And, in the coming months, he will graduate to increasingly more challenging programs on the Apple II, eventually moving on to programs designed especially for him by Villano.

And, maybe somewhere down the road, the old Lionel Mosing will emerge from the tall, thin man who can't speak or cry. ✚

WINNING ON WALL STREET™

COMPUTER SOFTWARE FOR STOCK MARKET INVESTORS AND TRADERS

Predicting the winds of Wall Street can be an emotionally charged gamble, or a coldly calculated science. Whether you play it by the seat of your pants, on the advice of experts, or like a mathematician, success in the stock market depends on decisions—YOUR DECISIONS.

No one can guarantee you success on Wall Street. WINNING ON WALL STREET can, however, give you powerful tools to help you beat the odds.

WINNING ON WALL STREET is a decision support software system for the Apple and IBM personal computers. This easy to use, fully integrated three module system delivers sophisticated data management, technical analysis, forecasting, and portfolio management capabilities

If you are serious about investing or trading, WINNING ON WALL STREET could be the most profitable buying decision you make.

Module 1: Trader's Data Manager™
Investor's data base. Manual data entry or automatic download. Displays. Reports. Interactive Graphics.

Module 2: Trader's Forecaster™ (requires Trader's Data Manager)
Comprehensive tech. analysis/forecasting toolkit. Classical + proprietary methods. Point/figure charting. Interactive graphs.

Module 3: Trader's Accountant™
Sophisticated Portfolio Management. P&L, tax, cash mgmt., splits, margins, interest, more. "Simulations." Download current quotes.

WINNING ON WALL STREET™ The Complete System
Contains Modules 1, 2, & 3. Completely integrated. Most powerful system available.

See your local dealer or call or write for a free brochure

WINNING ON WALL STREET™
SUMMA SOFTWARE CORPORATION
P.O. Box 2046
Beaverton, Oregon 97075
(503) 644-3212

Dept. 705 1-800-547-3000

SUMMA™ Software

NOW AVAILABLE FOR IBM PC & PC XT

*Summa Software,™ Winning on Wall Street,™ Trader's Data Manager,™ Trader's Forecaster,™ Trader's Accountant™ are trademarks of Summa Software Corporation. Apple® is a registered trademark of Apple Computer, Inc. Copyright © 1983, Software Corporation. All rights reserved.

CIRCLE 232 ON READER SERVICE CARD

DOWN TO THE

By simulating conditions at sea, Apple helps take the guesswork out of an ancient craft. The result is sleeker, fleeter boats.

At the Lazzara Marine Corporation in Tampa, Florida, in a shed the size of an aircraft hanger, carpenters are building a model of a boat. They are as skillful as the ancient Phoenicians, whose techniques they have borrowed, but this vessel will never enter the water. It bears the same relationship to the final boat as a carousel pony does to the winner of the Kentucky Derby. The two are similar in form, but light-years apart in substance.

Near the woodworkers' building sits another, slightly smaller structure that is one of the world's largest ovens. Inside, heat and vacuum will create a boat hull out of strips of space-age fibers that have

SEA IN CHIPS

been placed on a fiberglass mold made from the wooden shell next door. These modern materials are crucial to the final product, but equally important is the computer research that will make this boat light enough to take advantage of the wind's slightest sigh, yet strong enough to withstand the crunch of a hostile wave. There is an air of excitement here that mixes with the salt floating in on the mist from the Gulf, a tang that comes from working on an innovative project. These craftsmen are combining the resources of modern science—everything from Apple computers to polymers—with the ancient art of shipbuilding.

The Inexact Art

As recently as 10 years ago, engineers couldn't compute with any precision the forces at work when a boat crosses a wave. Everyone knew a hull had to be strong enough to withstand the shock of riding the crest or falling through the trough, but no one could put a number on the power of forces at work. That lack of

knowledge made designing a boat hull a hit-and-miss proposition, according to David Jones, research director for Lazzara Marine.

"What people used to say is, 'Well, we built a 40-footer and the hull was about that thick and it worked pretty good,' " he said holding his hands inches apart. " 'Well, we're building a 50-footer now, so we'll make it a little thicker.' That's really the way people did it."

Unlike other builders who are still guessing, engineers at Lazzara know that they are using exactly the right material to withstand stresses they have calculated from data they collected at sea with the help of Apple II Plus computer. Before the first strip of polymer goes on the mold, engineers have built dozens of versions of the boat that never sails farther than the 40-column width of the Apple's screen. Most of those simulations have broken on the electronic waves projected by custom-made software from the data. There are enough broken boats in the Apple to fill the Bermuda Triangle, but, for the first time, engineers will really know what their boats can do before the first breeze blows the vessel across a five-foot chop.

The Phoenicians would hardly recognize modern boat technology. Shipbuilding, one of humanity's oldest crafts, evolved from simple wooden rafts that were at the mercy of currents, to vessels powered first by muscle and wind, and later by engines. No longer just a form of commercial transportation, boating today has become a major sport whose enthusiasts range from sailors out for a day in the sun on their Lasers to America's Cup competitors on expensive 12-meter boats.

The engineering description of boats is similar to that of birds or airplanes. Water, like air, is a fluid medium. Keels on boats are foils similar to wings. Boatbuilders, like airplane manufacturers, want their products to become lighter, faster, and stronger. Yet boatbuilding has not attracted the volumes of experimental data and research from which flying has benefited.

Marine Construction

"Traditionally, there have been few dollars available for marine research. About three years ago, we knew that not enough was known," said Richard C. Lazzara, president of the yacht company that bears his name.

Lazzara started his company to build custom yachts, the upscale portion of the market that has been a family concern for 13 years. His family owns Gulfstar Inc., a St. Petersburg, Florida, company that produces a line of standard yachts. The difference between the companies is like the difference between Cadillacs and Rolls Royces. Though the entire yachting industry is basically a luxury-class operation, the new company builds boats that can cost over a million dollars and that are designed for competition. At that level of performance, ounces saved in construction will translate to more speed at sea. Efficiency is the watchword.

Lazzara left Gulfstar, where he was vice president and chief engineer, in 1979 to start Advanced Technology & Research Corporation, an aerospace company. During his work with aircraft, he became familiar with "pre-preg" construction, an improvement on fiberglass technology. He founded Lazzara to take advantage of the new technique.

Because the technology is new, no one really knew how much force a particular sample of material could withstand, or, indeed how much force it would have to bear. The aircraft industry is closely monitored by government agencies. The Federal Aviation Administration, for example, filmed dynamic loading tests in which building materials were deliberately broken by stress. How a material fails, under what pressure, and how quickly, are key engineering facts. Such information is not available to boatbuilders.

Ounces saved in construction will translate into more speed at sea. Efficiency is the watchword.

"For this reason, I realized that with our limited knowledge of the dynamic loading that was on a sailboat, it was time to take the next step to develop that information before we could start building pre-preg," Lazzara said.

Enter the Apple

To gain that knowledge, the company launched a research project under the direction of the 30-year-old Jones, whose first step was to recruit two engineering professors from the University of South Florida College, Tony Llewellyn, 50, and Stan Kranc, 40. Llewellyn and Kranc, both boating enthusiasts, designed the software to run the Apple and served as consultants to Lazzara Marine.

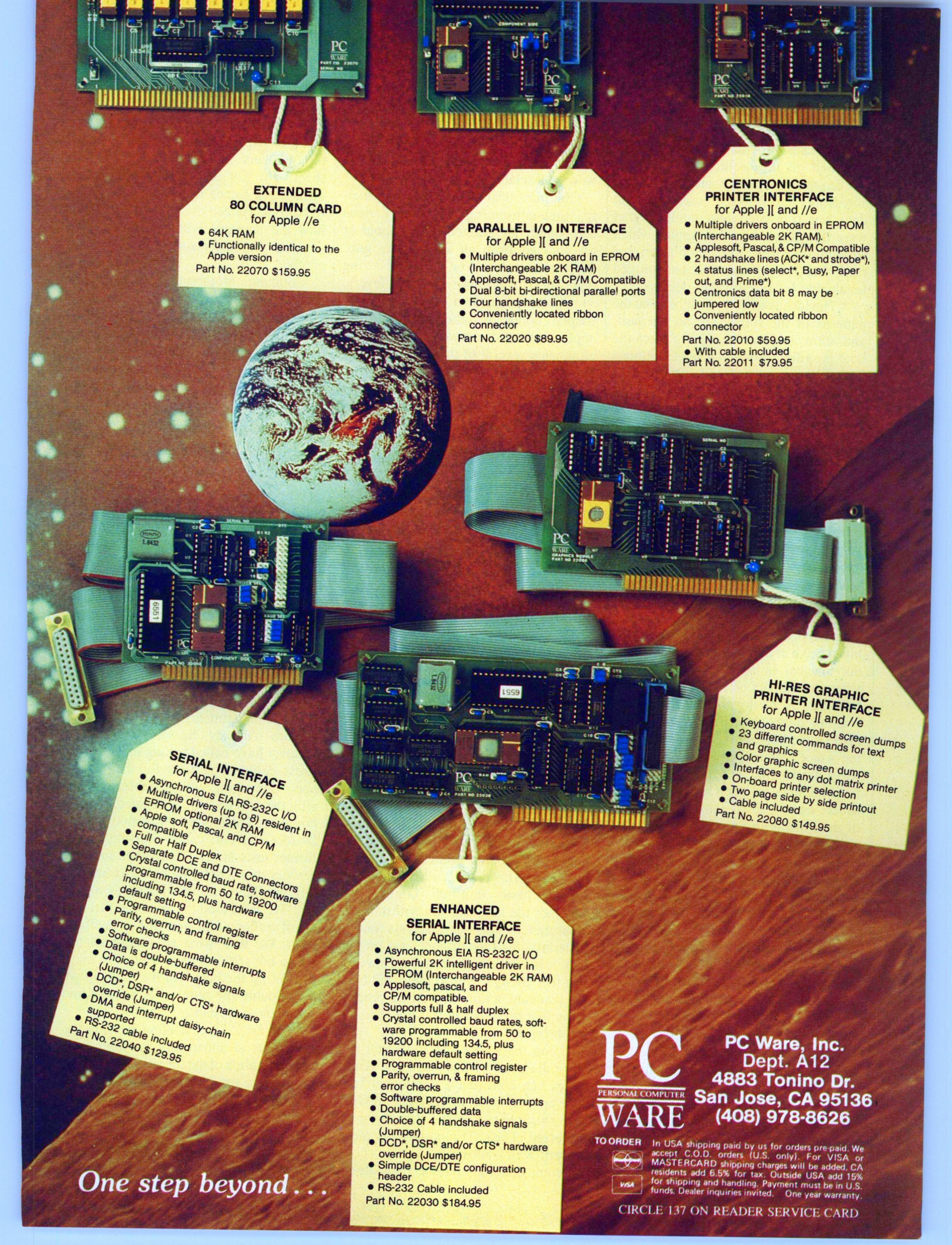
"For this project we decided to use Apples because that's where our expertise was. We happen to have a background in Apples because at USF, it became obvious in our departments around 1978 that the small computer was here to stay. When we first realized that very small, cheap computers were available, we decided they would be useful in a number of ways. First, they're calculating engines, that meant that students could do more. More complicated calculations became practical. We also had used computers to take measurements on systems that were changing so rapidly, you couldn't hope to look at the measurements by conventional methods. The Apple is easy to use, especially in an engineering environment where the first thing you want to do is pop the top off it and plug things into it, not just a box that you wiggle the keys on," Llewellyn said.

As part of an earlier project on pollution, Llewellyn and Kranc had taken the Apple to sea to run testing equipment, so when Lazzara contacted them about their project, it was natural to choose an Apple, Llewellyn said. "We had this practical acquaintance with it. I had a lot of confidence the thing could survive being knocked around."

Research Afloat

To measure the forces, the group took sensors and placed them directly into the hull of the boat. Sensors are pressure transducers that include a crystal and are about the size of a pencil eraser. Any pressure on the crystal is translated into voltage, which is transmitted to the oscilloscope. The electric current is displayed as a rapidly-changing curve. The digitizing oscilloscope, a Tektronix 5223, also converts electric pulses into numbers. The Apple was also connected to a PCB Electronics peak meter that measures maximum pressures. Because of the speed of the forces, there was no way, other than computers, to monitor the system.

The first laboratory test of the equipment was in late 1981. By the following year, the group had outfitted a 60-foot Gulfstar sloop named Reba with equipment. The whole assembly easily fit on board in a specially-designed cabinet. The brain was the Apple II Plus with standard 48K random-access memory and two disk drives, one for the software program and one for filing data. The Apple was connected by an IEEE-488 bus to the oscilloscope. Another board connected the computer to the peak meter. The set-up ran on the boat's power, which required an additional converter. The team connected a printer and a



EXTENDED 80 COLUMN CARD
for Apple //e

- 64K RAM
- Functionally identical to the Apple version

Part No. 22070 $159.95

PARALLEL I/O INTERFACE
for Apple][and //e

- Multiple drivers onboard in EPROM (Interchangeable 2K RAM)
- Applesoft, Pascal, & CP/M Compatible
- Dual 8-bit bi-directional parallel ports
- Four handshake lines
- Conveniently located ribbon connector

Part No. 22020 $89.95

CENTRONICS PRINTER INTERFACE
for Apple][and //e

- Multiple drivers onboard in EPROM (Interchangeable 2K RAM).
- Applesoft, Pascal, & CP/M Compatible
- 2 handshake lines (ACK* and strobe*), 4 status lines (select*, Busy, Paper out, and Prime*)
- Centronics data bit 8 may be jumpered low
- Conveniently located ribbon connector

Part No. 22010 $59.95

- With cable included

Part No. 22011 $79.95

SERIAL INTERFACE
for Apple][and //e

- Asynchronous EIA RS-232C I/O
- Multiple drivers (up to 8) resident in EPROM optional 2K RAM
- Apple soft, Pascal, and CP/M compatible
- Full or Half Duplex
- Separate DCE and DTE Connectors
- Crystal controlled baud rate, software programmable from 50 to 19200 including 134.5, plus hardware default setting
- Programmable control register
- Parity, overrun, and framing error checks
- Software programmable interrupts
- Data is double-buffered
- Choice of 4 handshake signals (Jumper)
- DCD*, DSR* and/or CTS* hardware override (Jumper)
- DMA and interrupt daisy-chain supported
- RS-232 cable included

Part No. 22040 $129.95

ENHANCED SERIAL INTERFACE
for Apple][and //e

- Asynchronous EIA RS-232C I/O
- Powerful 2K intelligent driver in EPROM (Interchangeable 2K RAM)
- Applesoft, pascal, and CP/M compatible.
- Supports full & half duplex
- Crystal controlled baud rates, software programmable from 50 to 19200 including 134.5, plus hardware default setting
- Programmable control register
- Parity, overrun, & framing error checks
- Software programmable interrupts
- Double-buffered data
- Choice of 4 handshake signals (Jumper)
- DCD*, DSR* and/or CTS* hardware override (Jumper)
- Simple DCE/DTE configuration header
- RS-232 Cable included

Part No. 22030 $184.95

HI-RES GRAPHIC PRINTER INTERFACE
for Apple][and //e

- Keyboard controlled screen dumps
- 23 different commands for text and graphics
- Color graphic screen dumps
- Interfaces to any dot matrix printer
- On-board printer selection
- Two page side by side printout
- Cable included

Part No. 22080 $149.95

One step beyond . . .

PC WARE
PERSONAL COMPUTER

PC Ware, Inc.
Dept. A12
4883 Tonino Dr.
San Jose, CA 95136
(408) 978-8626

TO ORDER In USA shipping paid by us for orders pre-paid. We accept C.O.D. orders (U.S. only). For VISA or MASTERCARD shipping charges will be added, CA residents add 6.5% for tax. Outside USA add 15% for shipping and handling. Payment must be in U.S. funds. Dealer inquiries invited. One year warranty.

CIRCLE 137 ON READER SERVICE CARD

clock to the machines so that data could be retrieved on paper and tagged with the time measurements.

As the newly-outfitted Reba sailed in the Southern Ocean Racing Conference regatta, each wave that pressed on sensor appeared on the oscilloscope, and the whole pattern of pushes and pulls pulsed across the screen like a heartbeat. That data was translated into numbers that were downloaded to the Apple, which stored it on a disk. Reba didn't win that race, but the information has proved invaluable for future yacht designs.

"The idea is to try to deduce what the patterns of the forces are on the hull, and, ultimately, on the rigging when the boat is sailing in various sea conditions on various courses," Llewellyn said. Kranc added: "We're trying to understand how the patterns interact with the structure of the boat. First, what is the push? Second, what is the response?"

Pressure Patterns

The team is still studying the data it has accumulated. "I've been looking at the data. We have 27 disks of data and approximately eight-and-a-half miles of strip chart. We've been going through it trying to pull out relationships," Jones said.

But there have been some early findings, including being able to quantify what happens when a boat, for example, hits a wave at a 45-degree angle. That is not unusual in an even moderate sea where the impact of the wave on a sailboat can be harder than a grown man slapping a table so hard that it bounces. Half of the boat's hull could rise out of the water before it plows into the next wave. Depending on sea conditions, that force could be as much as 16 pounds per square inch— about equal to the weight of the Pittsburgh Steeler's entire offensive line thrown against a space one foot square. That force could hit in just a few milliseconds, according to the preliminary data.

"You want the boat to survive that, but you don't want it to be any heavier than it has to be. That's the research area and that's what nobody knows about. We don't know what the magnitude of the forces is, and the qualities of the material are only approximately predictable," Llewellyn said.

Simulations

While the data is still sketchy, the group has been able to use it to actually build a boat. That process also involves the Apple, now safely, though temporarily, landlocked in the company's offices.

When boats were built of wood, you could enter a workshop, wade through pounds of shavings, and smell the aroma of different planks waiting to be cut to size and bent to shape. Fiberglass changed that, and "pre-preg" construction, borrowed from the aircraft industry, threatens to change it all again.

New Materials

Fiberglass boat construction is a smelly, time-consuming process. Various compounds are painted onto a mold or are sprayed from an air-pressure gun. Polymers are mixed on the mold during that spraying. Often several layers, sometimes separated by variously-shaped cores of other material, are applied on top of one another. Pre-preg eliminates several of these steps, where errors can occur. Pre-preg comes in premixed, uniform sheets that are stored in a freezer until they are pressed onto a mold. This new technology prevents bad mixing or uneven application, problems that can impair a boat's structure and, eventually, its performance.

"Technique is really the key. You make a keel, stick it on a boat, and if it's not perfectly true, it doesn't work well. If you have one true foil, it's similar to a wing and will work much better than if it's not true," Jones said.

Fiberglass boat construction is a smelly, time-consuming process.

Improved technique is only half the story. New materials are lighter and stronger than ever. In the past three decades, synthetic fibers and new adhesives have opened a smorgasbord of possibilities. Such materials as Kevlar and graphite can be layered or separated by a honeycombed core that creates a triple-ply panel. This panel, called a laminate, is the basic unit-hull construction. Whether the laminate can withstand the pressures of the sea depends on the materials, the type of core, and on how well it is bonded. Once the only way to test that strength was to build and break the laminate, a time-consuming process. Now that process can be simulated.

Prototypes

Using the Apple and additional software designed by Llewelyn and Kranc, Jones can construct a theoretical laminate and subject it to different pressures and twists based on the data the group collected at sea. The program is menu-driven, which allows the user to choose different materials for the laminate. "I can go into the software and build the laminates right there on the screen. I can enter the properties of the core, and the different layers of the material, where I'm going to put Kevlar and where I'm going to put graphite," he said, punching numbers into a modified spreadsheet. He can also test the laminate against sea forces measured during the Reba trial. He can even plot graphically how the laminate will break, and can compare various constructions with one another.

Computer prototypes can easily cut design time in half. "In the next half hour, I can study 20 different laminates. It would probably take me all day to build them by hand," he said. Using the simulation, Jones was able to design 40 different laminates for a 50-footer now under construction. Eventually he selected six different laminates for different parts of the boat.

Once the laminates are chosen, pre-preg makes construction relatively easy. Workmen lay sheets of selected material onto the fiberglass mold built from the wooden model. The structure is baked at between 200 and 250 degrees Fahrenheit to start the catalyst that bonds the materials. Pumps suck out the air so that the pressure helps seal the panel. Depending on the size of the boat, the process can be finished in one long workday. Use of pre-preg cuts the hull construction time by at least 10 percent.

Future Sensations

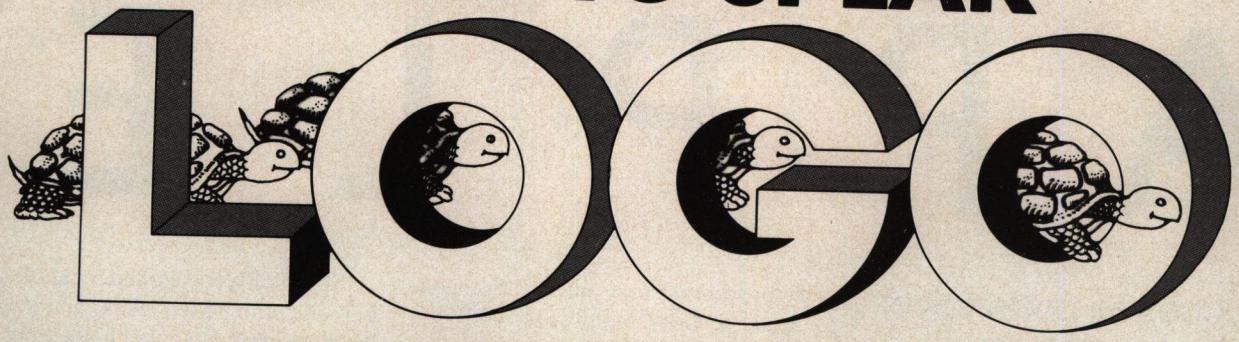
Jones foresees a time when the research department will be a profitable venture. Already, he said, other boatbuilders have called asking to run some stress comparison tests for their products. Consulting will probably increase after the next test run, scheduled for later this year. The group now is modifying a 24-foot sailboat, called Starship, to do further tests at sea. They hope to plant sensors throughout the hull and eventually put them into the rigging as well.

"We measured the bow and just one small section of the bow during the Reba tests. We took what we intuitively felt was a hot spot, an area of greatest magnitude, on the boat. On the Starship we will double the number of sensors and move them around.

"So far," Jones continued, "this has helped us to understand the forces and the magnitude of the forces. It has helped us get into the ballpark, now we know what game we're playing."

"You're beyond the stage," said Kranc, holding his fingers inches apart as Jones had done earlier, "of saying make it this big." ✚

LEARN TO SPEAK



Logo is the computer language that's sweeping the country with its simple, "turtle geometry" way of learning computer literacy. And *Logo: An Introduction* is the new, easy-to-understand beginner's guide that makes learning and using Logo fun!

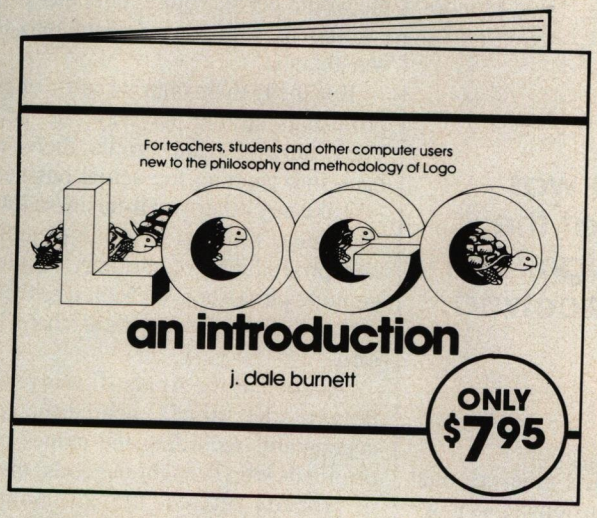
Written in simple language and set in big, easy-to-read type, *Logo: An Introduction* is specifically designed to be used by teachers and students who have little or no knowledge of Logo or computers.

Logo: An Introduction helps computer novices with:

- △ Creating simple shapes with the turtle and combining them to make more complex geometric forms
- △ Learning about "soft" and "hard" saves (temporary and permanent computer memory)
- △ Playing with symmetry and curves
- △ Learning about arithmetic, logic and Cartesian coordinates
- △ Using the idea of recursion—making a simple command repeat itself to perform more complex functions
- △ Experimenting with words and sentences —and more!

Logo: An Introduction doesn't bog you down or scare your students with complex technical details the way instruction manuals do. Instead, this book is written in an open-ended, exploratory style that captures the flexible spirit and freedom of Logo.

Use *Logo: An Introduction* as a supplement to your programming manual, as a source-book of ideas, as a primer on how to exploit the potential of this powerful language, and as a treasurehouse of suggestions for experiments with Logo. *Logo: An Introduction* is one book that belongs in your classroom or computer lab—and at only $7.95, it's easy to order more than one, and pass copies around to your students. Fill in and mail the coupon today, and enter the exciting world of Logo!



NEW—FROM THE PUBLISHERS OF *CREATIVE COMPUTING*

- Only $7.95!
- Large, easy-to-handle 11" x 8½" format.
- Written by a professional educator.
- Full of illustrations, examples, hints and tips, suggesions and explanatory notes.

For faster service, PHONE TOLL FREE: 800-631-8112.
(In NJ only: 201-540-0445.)

Also available at your local bookstore or computer store.

CREATIVE COMPUTING PRESS
Dept. NK8F, 39 East Hanover Avenue, Morris Plains, NJ 07950

Please send me _____ copies of *Logo: an Introduction* at $7.95, plus $1.50* shipping and handling, each. **#12L**

☐ **PAYMENT ENCLOSED** $_____ (CA, NJ and NY State residents add applicable sales tax.)

☐ **CHARGE MY:**
☐ American Express ☐ MasterCard ☐ Visa
(Charge orders $10 minimum)

Card No. _____ Exp. Date _____

Signature _____

Mr./Mrs./Ms. _____
(please print full name)

School/Institution _____

Address _____

City/State/Zip _____

*Outside USA add $3.00 shipping and handling. Shipped airmail only.

☐ Check here to receive FREE catalog of computing books, magazines and guides.

APPLE

A successful undercover operation used an Apple III to lead thieves from drink to the clink.

The staid and boxy Apple III as a daring crimefighter—that image may seem as ludicrous as your aged Uncle Fred skewering terrorists with his poison-tipped umbrella. But the Apple III revealed its secret identity as derring-doer earlier this year, when the police department in San Jose, California, informed the public of the success of a gigantic "sting" operation, a $1.5 million scam coordinated by the trusty beige computer.

It all started back in July 1982, at a bar called Russ and Rosie's on North 8th Street in San Jose. Just another bar on the face of it, maybe a little cleaner than most, the usual pool tables, dart boards, liar's dice, beer posters, and tacky hand-painted mirrors. A good working-class bar, with decent prices for food and beer, even if some of the clientele were a little strange, like the scruffy men who occasionally sauntered in with ill-concealed weapons . . .

Let's back up for a minute. Perhaps this story actually started three months earlier, when the San Jose police department was formalizing its plans for a "sting"—that is, to set up a legitimate front for a bogus fencing operation that would buy stolen goods and arrest the sellers later.

The department decided then to operate a bar as its cover for the sting, a business that apparently hadn't been tried before, according to Lieutenant Harry Stangel, commander of the burglary-prevention unit (BPU) of the SJPD. The operation received an initial $39,000 to build and operate the bar and to buy the property.

Around this time, a grateful Apple Computer, Inc., donated an Apple III to the department, through the San Jose city council, as thanks for helping the firm recover more than a quarter-million dollars' worth of stolen computers. As Detective Terry Moudekas of the burglary-prevention unit put it, "Someone in Apple security said, 'Hey, you guys need a computer.' "

The BPU duly received an Apple III, a ProFile hard-disk drive, two floppy-disk drives, and a monochrome monitor, with software donated by Software Publishing Corporation of Mountain View, California.

While the custodians of the Apple III were initiating it into the needs of police work, Russ and Rosie's opened its doors. The detectives of the burglary-prevention unit had built the bar themselves.

Shortly after it opened, undercover officers started spreading the word on the street that Rosie's Bar did more than just sell booze. No questions would be asked.

"Once someone heard that a person could come in and sell us stolen merchandise, he'd tell a friend. Customers were our best advertising," said Moudekas. In fact, he joked, "One criminal brought us so many customers that we bought him a bottle of his favorite beverage at Christmastime."

The team was surprised at the amount of high-tech property it received.

The bar was only eight blocks from the police department. Nevertheless, the detectives who were tapped to work at the bar didn't go back to the home office for nine months. The bar was run completely by sworn police officers, except for one man from the Alcohol, Tobacco and Firearms division of the U.S. Department of the Treasury; he worked as a bartender.

Seven officers worked regularly at the bar, including Moudekas, and seven to eight support personnel helped out. The only person there from the department who wasn't undercover was Lieutenant Stangel himself, who became the liaison between the bar and the BPU. He would casually bring in operating funds, money to buy the stolen goods, and (most important) the paychecks. Eventually he became known as a regular customer, though nothing more. "Obviously I didn't wear a three-piece suit," deadpanned Stangel.

The bar did quite well at first. When Russ and Rosie's started doing business, most of the bar's patrons were people from the construction industry, "a good blue-collar crowd, real honest people," said Moudekas. But when the illegal side of the business started to trickle in, the good customers vanished, and the legitimate business went down. "A lot of people would get nervous about other people coming in with guns tucked into their waistbands."

But then, their plan wasn't to have a profit-making bar anyway, he added. They plowed what profits there were back into running the actual business.

Like any other small-business owner, Moudekas took pride in the cleanliness and profitability of the bar, despite its genuine purpose. "We kept it real clean, and we never had a fight there," he said.

As soon as the Apple III was ready, it became the sting's behind-the-scenes accountant, recording the names of the criminals who brought in goods, the type of property offered, the case numbers, the categories of materials, and the number of the videotape cassette on which each transaction was recorded.

Yes, the less-savory patrons of Russ and Rosie's should have looked at the bar's decorative mirrors more closely—they told the story. The mirror in the actual barroom, which depicted a dissipated-looking Russ and a blowsy Rosie, featured a prominent bee with a highlighted "sting" perching on Rosie's head.

STING

The mirror in the back room, where the money and stolen property changed hands, didn't have any obvious visible hints, but just above the center of the mirror hanging over the couch a close observer might have discerned a video camera whirring behind the two-way glass.

Managers at electronics companies seem curiously reluctant to say that large quantities of components have been stolen.

During its nine months of double dealing, Russ and Rosie's Bar played host to 278 transactions of a questionable nature.

The setup ran like this: prospective "customers" would call first on the phone and make an appointment. They would park in back—this was important, since their cars might be loaded with "hot" property that wouldn't be appropriate for public viewing.

Then, said Moudekas, they would stroll into the gloomy back room to start haggling over the price. "Never give the customers their original asking price," was the policemen's motto. "We didn't pay top price for anything. We were cheap; we were real cheapskates. We were just minor bureaucrats with a budget. Besides, this would throw suspicion off."

The rumor on the streets was that the staff at Russ and Rosie's was connected with organized crime, an impression the staff didn't openly foster but wouldn't discourage either, as a kind of safety measure.

Three undercover officers took part in every transaction in the back room: one behind the desk, in view of the camera; another on the couch, beside the people with goods to sell; and one more behind the office's bar, off-camera.

The point, according to Moudekas, was always to keep the criminals outnumbered and at a disadvantage.

Moudekas and the other principal staffers, Steve Lewis, Will Montano, and Russ Royal, had different cover stories to lure in desired types of property. Montano, born in El Salvador and raised there until he was 12, posed as a gunrunner searching for weapons to ship to Salvadoran rebels. Moudekas, who is of Greek extraction, sometimes asked for guns on the pretext that he would smuggle them to Arab connections in the Middle East.

Investigators later entered the relevant information about the purchases onto the Apple's floppy disks. The files included the names of the suspects, the kind of property, the "Wasp" number ("Wasp" was the department's code name for the operation), the case number, and the location of the transaction within the mass of Wasp videotapes. The sting eventually accumulated 66 cassettes' worth of taped sales.

From these entries a plethora of lists could be assembled—lists of cases, transactions by seller, unidentified property, or even property with sufficient identification to be returned.

Sixty-five percent of the stolen property the undercover agents bought was returned to its original owner. The items for which the department couldn't locate a victim were signed over to the city for auction. One of the biggest gripes the BPU had about the property they received was that, though they knew almost everything had been stolen, the owners hadn't marked their property, making it difficult to return.

"There were times when I bought property within five to ten minutes after a burglary. We were at the edge of an industrial area, so many burglaries occurred right in our own neighborhood," Moudekas said.

The sting team bought everything from dancing shoes to machine guns, including an RPB M-10 45-caliber weapon supposedly bought to go to El Salvador.

One of the buying strategies was to ask criminals openly for guns, credit cards, and other items that could be traced readily. Said Stangel, "We looked for readily identifiable items, and guns, to get them off the street. Also credit cards, negotiables, and checks. We bought half a million dollars in negotiable securities and travelers' checks, figured on current market value, and that $1.5 million total didn't include credit lines." Manufacturing credit cards is where the real money is, he said.

The team was surprised at the amount of high-tech property it received: several hundred thousand dollars' worth of stolen computer chips and microprocessor parts, and about $100,000 worth of hard-disk drives.

Strangely, many of the computer-related items went unclaimed, said Moudekas. For instance, 5000 custom integrated circuits with a company's imprint languished in the department storeroom, circuits with a company's imprint, yet the company didn't report them missing. "The electronics industry is real lax on security," he said. Also, managers at electronics companies seem curiously reluctant to say that large quantities of

The Apple III became the sting's behind-the-scenes accountant.

components have been stolen. When questions arise, they're likely to say, "It must have been expended somehow" and request more money for the next year's budget, he mused.

Videotapes of some of the electronics transactions are revealing and often amusing. In one case a trio of men brought in an Apple II Plus, complete with peripherals, transporting the equipment to the bar in a car stolen just for the occasion. As the leader of the group displayed his wares, he began listing his "qualifications" for the sale, burglary and grand theft among them. His father was an attorney, he said proudly, as he continued to brag about his exploits.

The thief unquestioningly complied, greatly easing the task for his future captors.

continued to brag about his exploits.

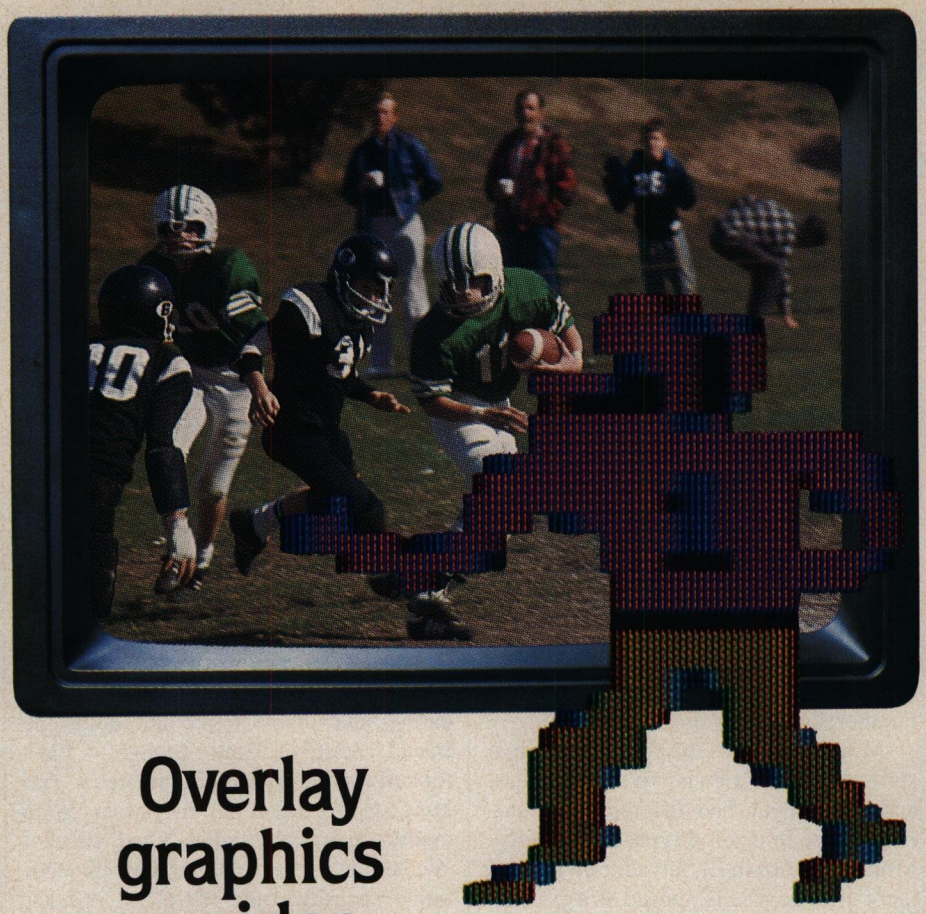
Another man who offered a stolen computer for sale inadvertently aided the police when one of the undercover officers asked him innocently how he knew the computer worked. "Oh, it works," the thief said. "Show me," said the detective. The man hooked up the computer and asked, "Well, what should I type?" "How about your name and address?" was the reply. The thief unquestioningly complied, greatly easing the task for his future captors.

Funniest of all might have been the pair of cocaine addicts who proffered a load of stolen computer chips. When they first brought in their booty—worth $600–700—the chief negotiator told them it was worth only $20 and offered them that for the whole batch.

At first the men begged for more money, protesting, "I have kids, he has kids," but a few minutes later the truth came out. One of the men was "sick."

"I gotta get me some dope. Cocaine, I'm a cocaine man."

They gave him some walking money, telling him that all he had were some relatively worthless "ten-position dual-edged card connectors" but that he could come back later for more money. When he returned after scoring the drugs he needed, he pressed again for further cash. When the undercover men questioned whether he was carrying a gun, he demonstrated that he was weapon-free by dropping his pants partway. "We



Overlay graphics on video with the amazing VideoSprite™

Now you can easily (and inexpensively) add graphics and animation to video from an Apple™ computer. Introduce yourself to VideoSprite. A new solid state board that plugs into the Apple computer and allows a composite overlay of two color video signals.

One signal is generated via the VideoSprite; the other can originate from any external color source, i.e., a color camera, video recorder, disk or computer. The appearance is that one video signal is overlayed on top of the other.

Thus, graphics or text created via the Apple appears superimposed over the video action. There's more! With VideoSprite, you can create and control colorful sprites using the Apple. (A sprite is any large, programmable object capable of independent movement, for example, a cartoon character.)

And best yet is the low cost! VideoSprite is only $795 retail, including software. (Even if you need to buy the Apple too, your investment is still a fraction of other alternatives.)

For all the details, write or call Synetix, Inc.

Synetix Inc.
10635 N.E. 38th Place
Kirkland, WA 98033
(206) 828-4884 (800) 426-7412

™ Apple is a registered trademark of Apple Computers, Inc. ™ VideoSprite is a registered trademark of Synetix, Inc.

CIRCLE 246 ON READER SERVICE CARD

P/S™ Buffer Card

The ONLY BUFFER that let's your Apple II™ & IIe™

ALL AT THE SAME TIME

- PRINT PARALLEL!
- PRINT SERIAL!
- PROCESS/COMPUTE/ENTER DATA!

ALL FOR $125

EXPANDABLE TO 64K

No more waiting for your printer or other peripherals to finish with your Apple before you can use it again. Just plug the P/S Buffer Card into any slot and cable-connect to your parallel output card. After transfering your data to buffer (it takes only seconds), you'll be able to continue using your Apple in a normal fashion while printing parallel, or serial. . . or both parallel and serial – all at the same time.

In the dual printing mode, data to be printed parallel and serial are stored separately in the buffer memory. The memory is divided between them by intelligent firmware, proportional to the storage requirements of each. The memory is expandable to 64K maximum in increments of 16K with plug-in RAM modules available from your dealer.

P/S Buffer Card has both a parallel output port and an RS-232C standard serial output port. When you need to change from parallel to serial, serial to parallel, or output both simultaneously, you don't have to physically change cards. The intelligent firmware lets you do it by either software command or (optional) hardware switch.

P/S Buffer Card interfaces with most popular parallel printer cards including Apple,™ Epson,™ Grappler,™ Graphitti,™ PRT-1,™ and Tymac.™ If you don't already have a parallel card, order the P/S Buffer "Stand-Alone" Card. It includes a built-in parallel interface. An optional graphitti plug-in ROM allows you to dump the Apple hi-res graphic screens with a few simple keyboard commands.

Many applications programs and operating systems such as CP/M™ and Apple Pascal™ require that the parallel interface be in a specific slot. So, leave it there. When you wish to print parallel, or serial, or both at the same time, just "tell" P/S Buffer Card what to do. It's that easy.

See your local dealer for details

SUGGESTED RETAIL PRICES:

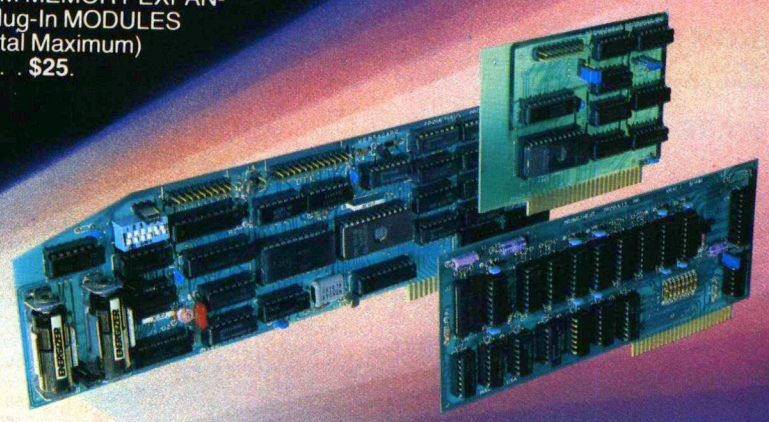
P/S 16K BUFFER CARD. For use with existing parallel interface card . . . . . **$125.**

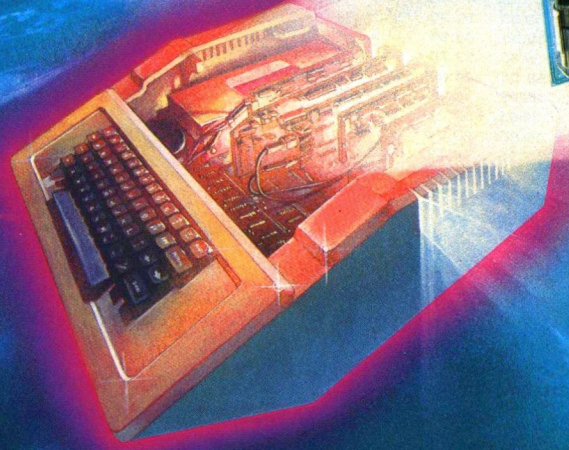
P/S 16K BUFFER "Stand-Alone" CARD with PARALLEL INTERFACE . . . . . **$199.**

SPECIAL! 16K P/S BUFFER "Stand-Alone CARD with GRAPHITTI GRAPHICS and Cables . . . . . **$249.**

16K RAM MEMORY EXPANSION Plug-In MODULES (64K Total Maximum) Each . . . **$25.**

Hardware "SWITCH" Option . . **$25.**





PROMETHEUS

PROMETHEUS PRODUCTS INCORPORATED

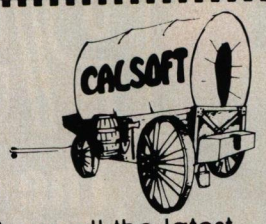
45277 Fremont Blvd. • Fremont, CA 94538 • (415) 490-2370

CIRCLE 191 ON READER SERVICE CARD

apple discount software

CALSOFT

Personal—Entertainment—Business SOFTWARE



We have all the latest software—ASK US!

Low Discount Prices/Check Our Super Sale Prices
Fast Convenient Service/Same day shipping on most orders
Large Selection of Software/Call or Write for our FREE Catalog!

***Call Toll Free:** (800) 423-5290 **In California:** (213) 991-9641*

BEAGLE

	List Price	Our Price
DOS Boss	24.00	20.40
Utility City	29.50	25.05
Apple Mechanic	29.50	25.05
Pronto DOS	29.95	25.45
Double Take	34.95	29.70
★ **Beagle BASIC**	34.95	26.20

BPI SYSTEMS

General Ledger	395.00	316.00
Accounts Receivable	395.00	316.00
Accounts Payable	395.00	316.00
Businesss Analyst	195.00	165.75

BANK STREET WRITER
~~69.95~~ 52.45

BRODERBUND

★ **The Arcade Machine**	59.95	44.95
Choplifter	34.95	29.70
★ **AE**	34.95	26.20
Sea Fox	29.95	25.45
Gumball	29.95	25.45
Lode Runner	34.95	29.70
Spare Change	34.95	29.70

CONTINENTAL

★ **Home Accountant**	74.95	56.20
★ **CPA Modules #1-4 (each)**	250.00	187.50
FCM	99.95	84.95
Tax Advantage	69.95	59.45

DECISION SUPPORT

The Accountant	129.00	109.65
★ **The Business Accountant**	255.00	191.25

EDU-WARE

Prisoner 2	32.95	28.00
★ **Algebra 1-4 (each)**	39.95	29.95
Algebra 5 & 6	49.95	42.45
★ **Fractions/Decimals (each)**	49.00	36.75
PSAT/SAT Word Skills (each)	49.00	41.65

HAYDEN

★ **Orca/M**	149.95	112.45
Pie Writer 2.2	149.95	127.45
Sargon II	29.95	25.45

INFOCOM

★ **Zork I, II, III (each)**	39.95	29.95
Deadline	49.95	42.45
Starcross	39.95	33.95
Suspended	49.95	42.45
Witness	49.95	42.45
Planetfall	49.95	42.45
★ **Enchanter**	49.95	37.45
Infidel	49.95	42.45

MICROSOFT

	List Price	Our Price
★ **Multiplan**	275.00	206.25
Typing Tutor II	24.95	21.20
★ **Applesoft Compiler**	175.00	131.25
Multi-Tool Financial Statement	100.00	85.00

PENGUIN

★ **Complete Graphics System**	79.95	59.95
★ **Graphics Magician**	59.95	44.95
Transylvania	19.95	16.95
The Quest	19.95	16.95
Coveted Mirror	19.95	16.95

SIERRA ON-LINE

Ulysses	34.95	29.70
★ **Dark Crystal**	39.95	29.95
Cross Fire	29.95	25.45
★ **Screen Writer**	129.95	97.45
★ **Screen Writer Professional**	199.95	149.95
★ **Ultima II**	59.95	44.95
Frogger	34.95	29.70
The Artist	79.95	67.95
★ **General Manager**	229.00	171.75
Homeword	49.95	42.45
Jawbreaker	29.95	25.45
Troll's Tale	29.95	25.45
Sammy Lightfoot	29.95	25.45
Mr. Cool	29.95	25.45
Quest for Tires	34.95	29.70
Oil's Well	29.95	25.45
Aquatron	29.95	25.45

SPINNAKER

★ **Snooper Troops #1, #2 (each)**	44.95	33.70
The Most Amazing Thing	39.95	33.95
Face Maker	34.95	29.70
Kindercomp	29.95	25.45

ASCII EXPRESS PRO
~~129.95~~ 97.45

STRATEGIC SIMULATIONS

Computer Quarterback	39.95	33.95
Napoleon's Campaigns	59.95	50.95
Guadalcanal Campaign	59.95	50.95
Cosmic Balance II	39.95	33.95
Germany: 1985	59.95	50.95
Bomb Alley	59.95	50.95
★ **Fighter Command**	59.95	44.95
RDF: 1985	34.95	29.70
★ **North Atlantic '86**	59.95	44.95
Knights of the Desert	39.95	33.95
Geopolitique 1990	39.95	33.95
★ **Ringside Seat**	39.95	29.95
Broadsides	39.95	33.95
Professional Golf Tour	39.95	33.95
Fortress	34.95	29.70
Queen of Hearts	34.95	29.70

SIR TECH

	List Price	Our Price
Wizardry	49.95	42.45
Knight of Diamonds	34.95	29.70
Legacy of Llylgamyn	39.95	33.95

PFS:WRITE
~~140.00~~ 105.00

SOFTWARE PUBLISHING

★ **PFS:File**	125.00	93.75
★ **PFS:Report**	125.00	93.75
★ **PFS:Graph**	125.00	93.75

MISCELLANEOUS

Accounting Plus G/L	395.00	316.00
Chess 7.0	69.95	59.45
★ **DB Master 3.0**	229.00	171.75
★ **DB Master 4.0**	350.00	262.50
Dollars & Sense	100.00	85.00
★ **Incredible Jack**	179.00	134.25
Ken Uston's Blackjack	69.95	59.45
Lisa 2.6	79.95	67.95
Master Diagnostics	55.00	47.75
Mastertype	39.95	33.95
★ **Merlin**	64.95	48.70
Micro Cookbook	40.00	34.00
Microterminal	84.95	72.20
Miner 2049er	39.95	33.95
★ **Sensible Speller IV**	125.00	93.75
Spellicopter	39.95	33.95
Sticky Bear ABC	39.95	33.95
Tax Preparer 1984	CALL	CALL
Terrapin Logo	149.95	127.45
Transend II	149.00	126.65
Ultima III	54.95	46.70
★ **Visicalc**	250.00	193.75
Visicalc 80 Col. Preboot	49.00	41.65
Zaxxon	39.95	33.95

HARDWARE

Amdek Color I Monitor	379.00	303.20
Buffered Grappler Plus	239.00	191.20
Enhancer II	149.00	126.45
EZ Port II	34.95	29.70
Gemini Star 10X Printer	499.00	399.20
Koalapad Touch Tablet	124.95	106.20
★ **Kraft Joystick**	64.95	48.70
LPS II (Light Pen)	349.00	279.20
Microbuffer II (16K)	199.00	159.20
Micromodem II	379.00	299.00
RAMCARD (16K)	99.95	84.95
★ **Smartmodem 1200**	699.00	524.25
SOFTCARD	345.00	276.00
System Saver	89.95	76.45
★ **TG Joystick**	64.95	48.70
Ultraterm	379.00	303.20
Videoterm	279.00	223.20

CALSOFT
346 N. Kanan Rd. #103
Agoura, CA 91301

***Call Toll Free:** (800) 423-5290 **In California:** (213) 991-9641*

We accept Mastercard & Visa (include # and Expiration Date), check, COD $2.00 extra), or Money Order. California residents add 6% sales tax. Include $2.00 for shipping (UPS Blue Label $3.50, Canada $6.00, other foreign countries 10% of order - minimum $10.00).

★ **Sale prices are through February only! Prices subject to change without notice.**

CIRCLE 142 ON READER SERVICE CARD

gave him $5 extra for the show," Moudekas laughed. Nevertheless, the man received a total of only $30 for the chips, the show, and his Timex watch.

That man, Moudekas added, had escaped from a Michigan state prison on charges of second-degree murder and has since been extradited.

Thanks to the BPU's videotapes and to the meticulous record keeping of the Apple III, the SJPD has had a 100% conviction rate on all the sting cases that have come to trial, according to Stangel. When the arrestees came up for arraignment, all the judges had to do was look at lists. "It gave the judges a good ballpark figure to work with [on the amount of the theft or sale] and didn't tie up my investigators' time."

One judge told Stangel that the city had saved about $50,000 in the first two days of court proceedings, with only the first 15 or 20 criminals she'd sentenced.

One hundred seven criminals had been arrested as of October 1983, with 11 fugitives still at large. The sting officially shut down in the early spring, but the court cases are still being tidied up. At this writing, 48 people who have pleaded guilty or have been found guilty have been sentenced to state prison. Approximately 20 more, who were convicted of lighter offenses such as selling a single marijuana cigarette or one car stereo, have been sentenced to county jail.

What the BPU liked most about the videotaping and recording on computer of these transactions, Moudekas said, was the skirting of complex constitutional questions.

"We short-circuited the criminal-justice system. There was no problem with a search warrant being declared invalid later. Here, these guys bring in the property, we hand them $200 in cash, they give us the stolen property. No search and seizure. On film and sound there's really not much defense. Once they see the tape, they're more than willing to plead guilty." The department has yet to go to a jury trial for any of its arrests from the sting.

'Once they see the tape, they're more than willing to plead guilty.'

Stangel noted that the San Jose sting operation was one of the most successful stings ever put together in the United States. Thanks again to the Apple III, the cleanup procedures took only eight days, instead of the several weeks common after such major undertakings. "We *could* have done it without [the Apple III], but it sure made our job a hell of a lot easier," said Moudekas.

The Apple III now holds all of the BPU records, management records, data on court cases, and intelligence information. All disks with sensitive data are locked up in a vault at night.

After working so closely with the computer, Stangel is sold on the machine.

"We're working on getting everything on it," he said. "Within three to four months, everything I need as a manager will be there. Instead of in file cabinets, it will all be on disk."

The BPU isn't the only unit of the San Jose police department to get computer-happy, though. According to Stangel, "We're probably the most computer-oriented department in the whole U.S. Our department does much more with less personnel, and a lot of the department's efficiency can be attributed to computers.

"Any department that hasn't gone to computers by now will lose in the long run." ✚

DISKETTES

maxell®

REG. PRICE
28.95 5¼" SS/DD SOFT SECTOR
39.50 5¼" DS/DD SOFT SECTOR

1 Buy 2 to 4 Boxes
Get a Library Case With Ea. Box Free
or
10% OFF REG. PRICE
$4.50 VALUE

HOLIDAY GRAB BAG
VERBATIM 5¼ SS/DD SOFT SECT. 23.95
MEMOREX 5¼ SS/DD SOFT SECT. 23.50
3M - SCOTCH 5¼ SS/DD SOFT SECT. 22.50

2 maxell Buy 5 to 9 Boxes
Get a Plastic Storage Flip n File Box (Holds 75 Mini-Disks) Free
or
15% OFF REG. PRICE
$35.00 VALUE

Add $2.00 Handling in USA
C.O.D.
5% Tax in Fla. Only
APO/Box No's & Canada Add 3.50 Shipping

3 maxell Buy 10 Boxes
Get a Complete Computer Maintenance Kit Free
or
25% OFF REG PRICE
$45.00 VALUE

MEGA BYTE INDUSTRIES
4699 S.W. 45th Street
Ft Lauderdale, Florida 33314
305-587-1130
1-800-327-1013

Allow one week delivery. This offer may be retracted anytime.

CIRCLE 168 ON READER SERVICE CARD

ADALAB™ Automates Lab Instruments

- Interactive Microware's general-purpose ADALAB™ data acquisition and control system interfaces with virtually any lab instrument using a recorder or meter, including GC and HPLC systems, spectrophotometers, pH meters, process control apparatus, thermocouples, etc.
- Lab Data Manager™ software facilitates single or multi-channel acquisition, storage, display and chart recorder style output of lab instrument data. IMI QUICKI/O software operates within easy-to-use BASIC!
- Thousands of scientists currently use IMI software and/or ADALAB products worldwide!

*Price includes 48K APPLE† II+ CPU, disk drive with controller, 12" monitor, dot matrix printer with interface, IMI ADALAB™ interface card.

†Trademark of Apple Computer, Inc.

Attention APPLE Owners

IMI'S ADALAB INTERFACE CARD IS AVAILABLE SEPARATELY FOR ONLY $495

(Includes 12-bit A/D, 12-bit D/A, 8 digital sense inputs, 8 digital control outputs, 32-bit real-time clock, two 16-bit timers plus QUICKI/O data acquisition software.)

imi

INTERACTIVE MICROWARE, INC.
P.O. Box 771, Dept. 209
State College, PA 16801 (814) 238-8294

CIRCLE 145 ON READER SERVICE CARD

▶APPLES AT WORK

BY T.A. ARNOLD

COMPUTER CRIME STOPPERS

The Apple's just got the facts, ma'am. And now the police have an electronic dragnet.

Early one morning in 1981 a man climbed onto the second-story balcony of an apartment building in a small California town. He was approximately 6 feet tall, dressed in dark clothes, and had his hair cut short. The man entered the apartment through an unlocked sliding glass door and found the occupant, a woman, asleep. He waited a while, then attacked her. Eventually she broke free and escaped to a neighboring apartment. The manhunt began.

Shortly after the attack, two detectives, a sergeant, and a records clerk were called in. Their duty—to find the suspect—was clear, but their methods were out of date. While a detective and patrol officers interviewed the victim and witnesses, other officers began combing local records by hand for names of any persons who might match the partial description of the attacker. The files searched included those of known criminals, field contacts, and crime with a similar method of operation, and were strictly in the local and neighboring community.

In most cities in the United States, the collection and processing of evidence and information is an unwieldy process. The complexity of the process has led some police agencies to think about spending part of their budgets on microcomputers.

The amount of information commonly confronting police makes the computer's potential clear. For example, if the suspect had received a traffic ticket on the night prior to the attack near the same location, without a computer the investigators might never know about it. It is not feasible to cross-file and index every detail—sex, race, height, weight, hair and eye color, date of birth, etc.—that is recorded on a traffic citation in a manual system.

Computers may not be nuclear hand grenades, but they still have to stand the test of the patrolman on the graveyard shift.

In fact, procedures to hand-search record files are so costly and time-consuming that the method has been reserved for major crimes only. Few agencies have the resources to initiate a major search for each petty theft, auto burglary, act of vandalism, or other minor crime.

Therein lies the problem. How can law enforcement agencies gain quick access to records? Not just federal or state files, but their own incident records. How can they develop reliable statistics from these files?

Information Network

Over the years, police departments, like all government bureaucracies, have developed massive index, cross-reference, and cross-cross-reference systems. Unfortunately, in a number of cases, these systems have become "one-way" files—information comes in but never goes out. For example, a homeowner's association in a large metropolitan area calls its police department to ask a simple question: "How many daytime burglaries have we had over the past month?" Unless the department is willing to begin a manual search covering the reported locations of all burglaries in the city precinct to find those in the target area, the answer to the homeowner association's question will probably be an estimate that could be 20% higher or lower than the actual number.

Since the problem of too many statistics and too much information management afflicts many city agencies besides the police, the solution for some municipalities has been to purchase a city-wide computer system or engage a data-processing company. For some, the cost of daily records has been in five or six figures.

Special Problems

This has led to problems for police departments: Public-domain software is not always sufficient for the investigative needs of law-enforcement officers, and there are confidentiality problems (the Water Department or a data-processing company don't need access to a list of juvenile offenders). Perhaps most important, in some ways, the police are just like the population at large—some simply know nothing about computers and some are computerphobic.

Nevertheless, law-enforcement officers are a unique breed. They are intelligent for the most part, suspicious, and highly curious. One training instructor at the Alameda County Sheriff's Department Training Center in California said, "If you gave a cop a nuclear hand grenade and told him not to use it, he'd probably have to take it around behind a barn and test it."

Computers may not be nuclear hand grenades, but they still have to stand the test of the patrolman on the graveyard shift.

Despite their potential, in a number of departments computer use has been limited. Either because of operating problems or management fears, only a select few staff members have become system users. Often line patrolmen and detectives cannot spare time from other responsibilities to develop the skills to operate the computers. And during the more routine investigations that occupy over 90% of their time, they are forced to use machines during limited hours or through a time-consuming chain of command.

Apple to the Rescue

In mid-1980, with personal computers becoming increasingly important, a programmer named Mark Worsnop developed a simple filing program for the Apple II to keep track of Field Interview (FI) reports for the San Mateo County Sheriff's Office in northern California.

The department's problem was indexing and retrieving the large quantity of FI cards produced each week in the county. These reports were on 3-by-5-inch index cards that were filled out by patrol officers when they encountered possible criminal activity. Before the Apple, detectives reviewed the cards each morning. If he saw something of interest about a possible criminal, the investigator would copy the information. Afterwards, the FI cards were filed alphabetically, and the information disappeared into the file.

Worsnop's early FI file was a simple program with up to 18 user-definable data fields and on-screen prompting.

Members of the sheriff's office were shocked by how easy the program was to use and at its relatively low cost. More San Francisco Bay Area departments began investigating the use of micros—particularly Apples—to supplement their citywide systems. And in March 1981, Apple Computer sponsored a grant program in which six police agencies were given Apple II's.

As a result, a users' group formed in the Bay Area and Mark Worsnop developed ISCARS, which is a law-enforcement program. This software allowed agencies to design files with up to 18 fields, password file security, menu selections and prompting, utility functions, patterned logic searches, report generation, and statistical analysis. To run ISCARS, the department needed an Apple II or Apple II Plus with 48K RAM, a monitor, and at least one disk drive and controller.

The participating departments tested the software and had a few minor complaints that Worsnop remedied. But generally, they were pleased with how easy the system was to use. A patrol officer or detective could be trained on the Apple in approximately 30 minutes.

Lt. Jerry Little and the Los Altos Police Department in California have been using ISCARS and the Apple II since 1981. Some of their successes included the solving of a neighboring jurisdiction's sexual assault case. Los Altos detectives were contacted with a request by the other agency to search through their system for possible suspects in a number of laundromat rapes. With only a partial description of the suspect, they queried their system and came up with six possible names. Through investigation, one was identified as the rapist. This arrest cleared numerous rape cases throughout the county.

Members of the sheriff's office were shocked by how easy the program was to use and at its relatively low cost.

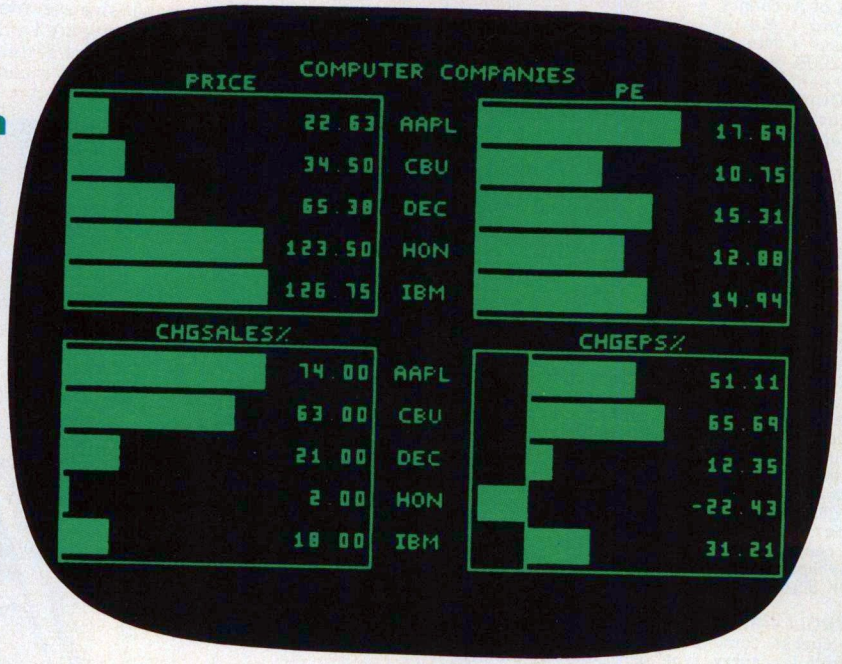
Since the pioneer software was introduced, Mark Worsnop has opened Solon Corporation and developed an upgraded

NEW from Standard & Poor's—
A breakthrough for Apple II owners who invest.

ANNOUNCING STOCKPAK II— STOCK MARKET SOFTWARE FOR HARDNOSED INVESTORS

Send for our demonstration diskette and see why no one can aid investment decision-making like Standard & Poor's.

Compare our software system for speed, features, and ease of use.



Comparisons of Apple, Commodore, Digital, Honeywell and IBM on price, PE ratio, % Changes in Sales and Earnings. Recent Data. **Plotted in 30 seconds.**

Standard & Poor's Corporation has been a major supplier of financial information for over 120 years. Our publications and services are used by brokers, institutional investors and individuals throughout the country. Now our experience and expertise has produced "state-of-the-art" software that, with any Apple II, can help you become a Wizard of Wall Street. (IBM-PC version available early '84).

The Stockpak II System consists of one Program diskette and one (or more) Database diskettes. Each month, users receive a new Database diskette. In this way, current information is available on up to 4,500 companies.

With STOCKPAK II, you can do all this—

● *Look up key financial facts.*
What do you want to know about the stocks you own and those you're considering? Over 100 information items are available for each company in the database. Get the data you want instantly—whether it's S&P's exclusive stock ranking, earnings, dividends, sales, price history, balance sheet items, or performance ratios.

● *Graphically compare and analyze information on groups of companies.*
Want to see how sales and earnings of any company stack up against its competitors? Or how five high-technology companies do in terms of growth rate, yield, earnings-per-share, and price-earnings ratio? It's so easy with Stockpak II. Our unique graphic routines provide clear, meaningful comparisons.

● *Perform simple or complex 'screens' to find certain kinds of companies.*
In less than 30 seconds, you can match criteria of your own choosing against companies in the database to find only those that "fit." Request large companies with stable earnings and low P-E ratios...or, if you're more aggressive, relatively small companies with impressive sales and earnings performance. Request only companies in certain industries...or companies with low prices and high betas. You can easily customize information items, criteria sets and report formats to suit your own preference.

You be the judge...send for our demonstration diskette

No printed description can do justice to the performance of Stockpak II. So we've prepared a demonstration diskette to show you why and how our software can help you make better investment decisions.

Send for STOCKPAK II's Demonstration Kit. It's just $10.00.
Credit card holders call
TOLL-FREE 1-800-852-5200, Ext. 7.
In NJ, 1-800-442-1300, Ext. 7.
Or send the coupon today.

CIRCLE 224 ON READER SERVICE CARD

STANDARD & POOR'S CORPORATION
25 Broadway, New York, NY 10004

☐ Please rush me my STOCKPAK II demo diskette for the Apple II @ $10.00.
☐ Contact me when your IBM-PC version is ready.
☐ I'm convinced. I wish to subscribe to STOCKPAK II now on a money-back-if-not satisfied basis. Enter my subscription to the following monthly database service—
  ☐ COMPOSITE (1,500 leading companies from the NYSE, ASE and OTC). $275.00
  ☐ ALL—NYSE (about 1,500 companies). $275.00
  ☐ ALL—ASE (about 800 companies). $275.00
  ☐ ALL—OTC (*two* diskettes, about 2,200 companies). $520.00

☐ Check enclosed. (Please make out to Standard & Poor's)
☐ Please charge my credit card:
☐ Amer. Express ☐ VISA ☐ MasterCard ☐ Diners Club

Card # _____ Exp _____
Signature _____
Name (Print) _____
Street _____
City _____ State _____ Zip _____

Subscriptions to STOCKPAK II are tax-deductible. We will bill you for applicable sales tax. Apple II is a registered trademark of Apple Computer, Inc. 3GH-4AANO1

OPEN UP AN ACCOUNTING DEPARTMENT FOR $395.00

GENERAL LEDGER integrated postings from A/R, A/P and Payroll. **Prints 13 detailed reports** • Company or departmental Income Statements • **Comparative financial statements** with current, YTD, budget, and last year (month and YTD) • Presents everything you, your bookkeeper, and your accountant need to know • G/L reconciles all accounts and maintains extensive, detailed audit trails • Trial Balance includes all transactions • **Flexible Chart of Accounts** • True double-entry bookkeeping • Master File capacity: 400 accounts • Monthly Transaction capacity: 1,000 with 200K diskette; 3,500 with 500K diskette; 7,000 per Megabyte with a hard disk.

ACCOUNTS RECEIVABLE provides **instant, on-line customer account information (both current and aged),** complete invoicing (open-item or balance forward) and statement capabilities on optional preprinted forms give your company a professional image • Quickly identify overdue accounts, speed collections, help control cash flow • Detailed and summary customer activity and aging reports • Produces 8 reports • Automatic periodic customer/client billing option • Itemized monthly transactions • Master File capacity: 400 Customers • Monthly Transactions capacity: 800 with 200K diskette; 3,500 with 500K diskette; 7,000 per Megabyte with a hard disk.

ACCOUNTS PAYABLE maintains complete vendor/voucher history and includes **check-writing** capabilities • **Current and aged payable reports** • Cash flow/cash requirements report • Prints checks with comprehensive check stubs • **Produces 11 reports and documents** • Automatic pay selection program allows payment by due date or by discount date • **Manual and automatic checkwriting** • Check register • Master File capacity: 400 Vendors • Monthly Transactions capacity: 800 with 200K diskette; 3,500 with 500K diskette; 7,000 per Megabyte with a hard disk.

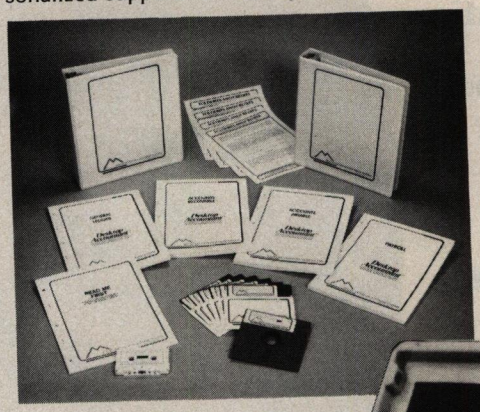
PAYROLL—Be the office hero each week when the checks come out on time! • **Calculates payroll for every type of employee** (hourly, salaried, and commissioned) and **prints payroll checks** (with popular, comprehensive check stubs) with an absolute minimum of input • Maintains monthly, quarterly, and yearly totals for reporting in **multiple states** • **User-maintainable Federal, State, and local tax tables** • W-2 printing • 941 Reporting • Produces 10 reports • Master File capacity: 400 employees.

CIRCLE 182 ON READER SERVICE CARD

Why staff up? With the Desktop Accountant™, all the accounting help your office needs can be at your fingertips!

Open up a wide new range of possibilities for your microcomputer! No matter what type of business you're in, Desktop Accountant will let you manage the financial end of it more professionally than ever before.

A Complete System with Support. Desktop Accountant includes accounts receivable, accounts payable, payroll and general ledger programs, along with comprehensive user manuals and training aids. We've even prepared an audio cassette tape to make learning the system fast and fun. And our telephone "hotline" means personalized support whenever you need it.



Desktop Accountant's fully integrated accounting system is a complete package of software, training aids, manuals and user's newsletter.

Produces 42 Reports. "Keeping the books" has never been so easy! Desktop Accountant prepares every bookkeeping and accounting report your growing business requires: from invoicing to statements to aged A/R listings; from cash distribution to A/P checks to vendor activity reports; from **complete** payroll checks and stubs to W-2 forms; from the chart of accounts to balance sheet and income statement, as well as many others so vital to efficient management.

Desktop Accountant is available for nearly every portable, personal and desktop computer. The system requires either CP/M® or MS-DOS™ (PC-DOS), Microsoft BASIC™, 64K RAM, two disk drives or hard disk, and a 132-column printer (or an 8½ " x 11 " printer with compressed print mode).

You won't find better quality software at such a low price—a price we can offer now because development costs were recovered years ago. Just **$395.00 for most CP/M® formats ($495.00 for IBM® and some CP/M formats) complete.** *Call for available formats.*

Order Desktop Accountant today! You'll soon see why we call it **INTELLIGENT SOFTWARE FOR INTELLIGENT PEOPLE.**

ROCKY MOUNTAIN SOFTWARE SYSTEMS
Business Microcomputers and Software

• California residents add 6½% Sales Tax • Payment by VISA/MasterCard/COD/MO/Cashier's Check • All Brand Names are manufacturers' registered Trade Marks • No sales to Dealers • Foreign orders please call or write before ordering • © 1983 Rocky Mountain Software Systems.

MasterCard VISA

To order Desktop Accountant or request further information, call toll-free:

☎ 1-800-832-2244
(In California call 1-800-732-2311)

or send orders to:

DESKTOP ACCOUNTANT
1280-C Newell Avenue, Suite 1212
Walnut Creek, CA 94596

version, which he named WISCARS. This new system includes the features of its predecessor and more. It has up to 40 data fields; controlled password entry to portions of the program; user-defined field length; indexed searches; series entry; optional network of up to 64 work stations; and 6-to-80-Mb data storage using a Corvus Hard Disk system.

A WISCARS system can be accessed via modem by an outside agency that uses an Apple computer system. With this, local police departments can retrieve FI and other investigative information from neighboring cities or counties at any time.

Detailed Records

The applications for the Apple in law enforcement is almost as diverse as the profession itself. The system with either the ISCARS or WISCARS software can be used by police administrators, records staffs, crime-prevention specialists, investigators, and patrol officers.

All of the agencies surveyed said that the Apple was a reliable and dependable tool, and some officers expressed surprise that the computers were able to survive the workload.

At the San Mateo County Sheriff's Office, a department with a staff of 249, their one Apple II is in service seven days a week, 24 hours a day. According to Lt. Harvey Rutenberg, approximately 50 people are assigned and trained to feed in data. This list includes station officers, records clerks, crime-prevention staff members, and administrative staff. Their Apple, operating with the WISCARS software package and a 5-Mb hard disk, is used almost exclusively for management information. Each month, it produces a detailed report that is approximately 200 pages long. This report includes analyses of reported offenses and incidents, beat activity, dispatched activity, automated alarm card, and traffic citation report. Much of the information is cross-filed.

While reviewing his list of monthly reports, Lt. Rutenberg said that the Apple has become one of the best crime prevention tools in the county. Members of the Crime Prevention Unit can review the monthly report and direct their activities to where they will be most effective. What were once just estimates on criminal activity have been replaced by facts.

For other police agencies using the Apple, the list of applications may also include any number of the following:

- *Case management:* The tracking of criminal cases after the original report has been turned in. This can include automated investigation notes, follow-up and disposition.
- *Crime analysis:* This is the crystal ball work of law enforcement. The prediction of crime is made much easier with accurate data on trends.
- *MO files:* This involves a cross-index system between certain known criminals based on their specific modus operandi or method of operation. It has been a fairly effective tool for the police, since most criminals stick with familiar techniques.
- *Known-criminal files:* Apple computers have made the storing and retrieval of data on criminals much easier. A set of floppy disks or a segment of a hard disk can replace huge file cabinets to store this information.
- *FI files:* When officers come into contact with persons possibly involved in criminal activity, they complete this simple field information report. Name, physical description, address, age, clothing, involved vehicles, companions, time, date, and location can be indexed and cross-filed.
- *Traffic-collision management:* This involves tracking all of the information on auto accidents to identify problem areas for specific enforcement.
- *Traffic-citation files:* Data in this file is entered in the same format as the FI files. Locations can be compared with the traffic-collision-management files and information on drivers can be cross-referenced for investigation.
- *Department statistics:* The Apple can reduce the massive task of compiling crime statistics, activity logs and reports. Individual formats can be designed to eliminate transcription.
- *Administrative files:* This might include officer training files, time sheets, and personnel records.

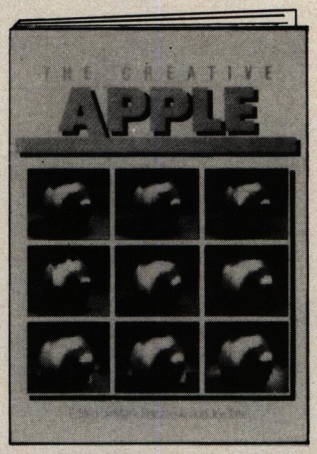
The applications for the Apple in law enforcement is almost as diverse as the profession itself.

And the list goes on and on—it's long enough that even police traditionalists are welcoming Apples to their ranks.

ISCARS and WISCARS are both products of the Solon Corporation. For more information, contact the Solon Corporation, 654 Bair Island Road, Redwood City, CA 94063, (415) 369-4934. ✚

ATTENTION APPLE® FREAKS!

Here's the book you've been looking for!



THE CREATIVE APPLE

The Creative Apple brings you the best articles and features on the Apple to appear in the past four years of *Creative Computing*. Revised and updated, this wealth of material gives you dozens of ways to tap the tremendous potential of your Apple, improve your programming skills, and expand your computing knowledge. Graphic utilities, animation, digitized images, music editing, educational software and applications, telecomputing, home control systems, VisiCalc and many other timely topics are thoroughly examined and discussed. Ready-to-run programs give you immediate use of this informative and stimulating collection, while a chapter on tips and tricks for easier programming lets you unlock the versatility of the Apple computer—and your own resourcefulness.

Whether for business, personal budgeting, the thrill of computer games or the development of educational applications, you'll find plenty here to help you get the most out of your Apple.

The Creative Apple, edited by Mark Pelczarski and Joe Tate. 8½ x 11", softcover, illustrated. $16.95

Apple is a registered trademark of Apple Computer, Inc.

CREATIVE COMPUTING PRESS Dept. NJ9C
39 East Hanover Avenue, Morris Plains, NJ 07950

Please send me _____ copies of *Creative Apple* at $16.95 each* plus $2 postage and handling. **#18R.**

Outside USA add $3 postage and handling charge.

*CA, NJ and NY State residents add applicable sales tax.

☐ **PAYMENT ENCLOSED $_____**

☐ **CHARGE MY:**
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Signature_____

Mr./Mrs./Ms._____
(please print full name)

Address_____ Apt_____

City_____

State_____ Zip_____

For faster service, **PHONE TOLL FREE: 800-631-8112**
(In NJ call 201-540-0445)

INSIDE APPLE/BY SHERRI GILMAN-THOMPKINS

WOMEN AT WORK

BEHIND THE SCENES AT APPLE COMPUTER

Is Apple the ideal place to work? Women interviewed by A+ think so.

Talk to the women at Apple Computer and you may mistake them for a pep club. Apple's pep club, that is.

Apple women who spoke to *A+* have nothing but praise for their employer. They describe the company in idealistic terms, saying it's a special place where common concerns of the workplace such as low productivity, boredom, and sex discrimination simply don't come up. Creativity and energy needed to get the job done take priority above all else, they say, including spare time with friends and family or for an outside hobby.

Working, Working but Loving It

Apple women say they routinely work 50-hour weeks. One woman admitted to having worked 90 hours one week, and many say that during busy times 70 hours on the job is commonplace. Some women acknowledged that sandwiching personal time into work time may be a juggling act, but they don't mind the long hours and rigorous schedule. It's the nature of the beast—of the computer industry, they claim—particularly at Apple.

As described by the women we interviewed, Apple is full of young—the average age is 28—enthusiastic overachievers who are concerned primarily with getting the job done well. The company itself is only six years old.

"You take personal responsibility for your goals there," said Ellen Nold, 37, the manager of marketing support for the Lisa computer division. "For the first time, I have a boss who gives me in-depth feedback on my work. When you do well for the company, it does well by you."

No Hocus-Pocus, Just 'People First'

According to Jay Elliot, vice-president of human resources, there's really nothing magical about Apple.

The work atmosphere is determined by the underlying Apple philosophy—that people are regarded and rewarded for their contributions as individuals. He said the company operates with a basic sense of trust and that employees do jobs they like and find stimulating. "The essential part is the people. The brains of our employees are what is going to make Apple tick," he said.

That philosophy is further enhanced, Elliot explained, by a generous benefit plan. Apple's employee package includes profit sharing, competitive salaries, dental and health benefits, and stock options.

Women make up 48% of Apple's 4500 employees worldwide, and the jobs they hold are as varied as their backgrounds. Jobs at Apple can be as intimately involved with the product as testing a microchip to much broader concerns such as tackling problems in contemporary education.

Hard Work and Dedication

"There's an energy at Apple I don't find everywhere. [It's] where there are very creative people. I feel as if I'm on a mission. People work very hard. It sounds Pollyannaish, but people are very dedicated to the product," said Joy McCulley, an office market manager.

It was McCulley's job to see that the new personal computer, called the Lisa, met its deadlines. During the year-and-a-half-long period when the project was underway, she coordinated the duties of between 300 and 400 people and worked 80- to 90-hour weeks, filled with meetings and strategy sessions. In one particularly grueling stretch during that period,

'The essential part is the people.'

McCulley remembers, she came to work at 7:30 A.M. and left at 9 P.M. the following day.

After the Lisa hit the market, McCulley, who is 40, took three weeks off to unwind. Since then, she has promised herself that such marathon days and weeks won't creep into her life again. Yet, she normally works 50 hours a week and said her job at Apple provides the constant challenge of ensuring that schedules are met and the best work is done.

"You make a commitment to doing a job, and you have no choice," she explained.

Define Your Job

What particularly impresses Barbara Bowen about Apple is the company's philosophy that each employee is an important part of the corporation.

"You talk to people and try your idea," she said. "You're allowed to write your own job description. This company will let you do as much as you're capable of. It's the direction we receive that is so wonderful."

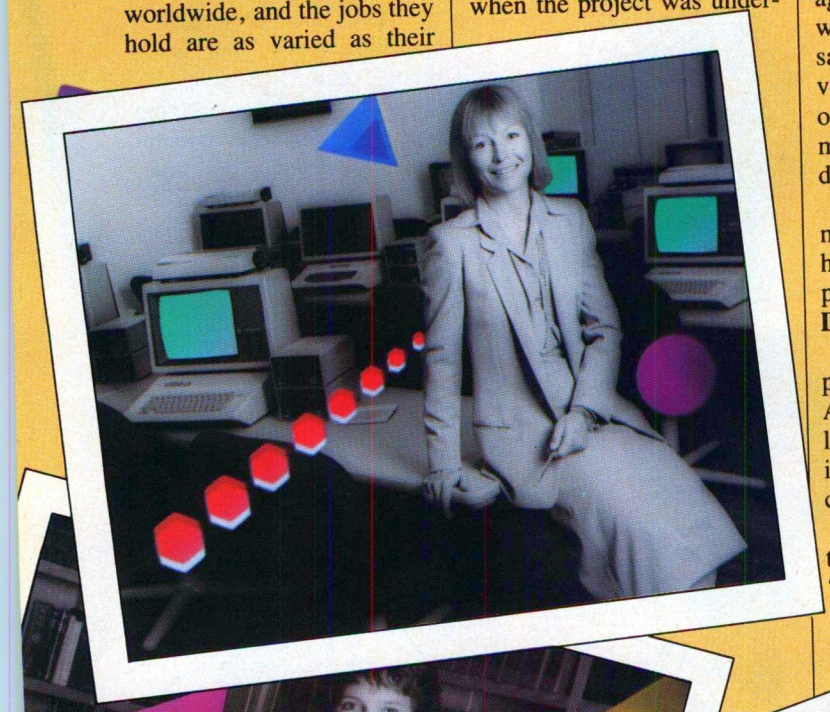
Bowen, 38, is director of the Apple Education Foundation. Prior to coming to Apple, she was a mathematics teacher. Her goal is to create a set of educational projects nationwide, through the company's educational division. The program aims at improving teaching and learning by using microcomputers. Bowen's specific target area is the problems in American public education documented earlier this year by a presidential commission.

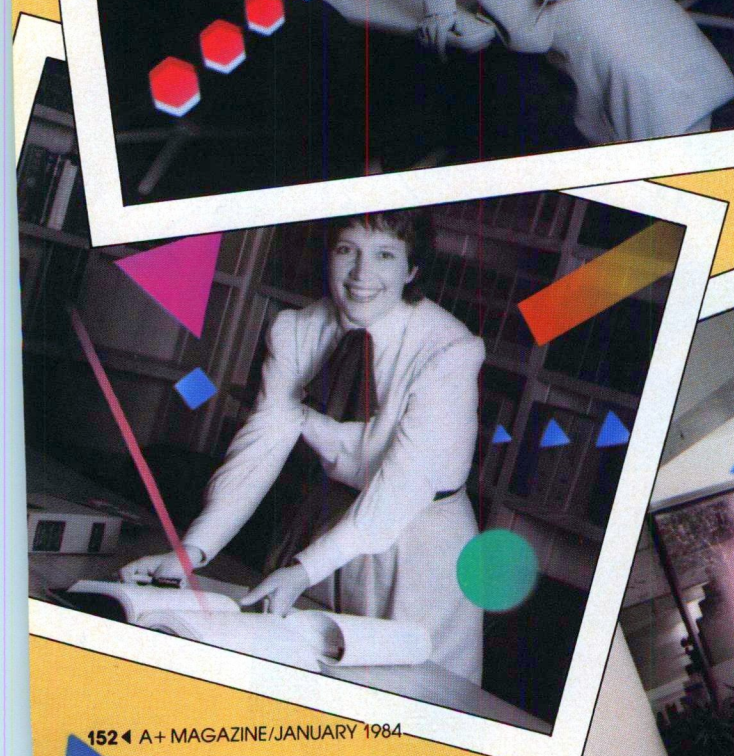
"I think teachers have low morale right now," she explained. "They can learn by using a micro; it's a unique tool for making a whole variety of materials available that were never before accessible."

Ida Cole, director of marketing for the Personal Computer Systems (PCS) division, now oversees 120 employees in what is her fourth job since coming to Apple; this sums up her feelings about her work: "I love it."

And that was after Cole had finished a 70-hour week at Apple. The schedule suits Cole because she's caught up in the excitement of the work. That excitement, Cole explained, stems from working in a fast-moving industry that is carving out new ground.

"It's like being in the middle of a case study that hasn't ended yet," she said. Cole, 36, admits her life has changed drastically in the two years she has worked for Apple. To her, the switch is for the better. "I sound like a martyr, but I'm really not," she said. She explained that get-togethers with friends, although important, are just less frequent. Extended





shopping trips or weekends away now are out of the question, she added.

"It sounds like a big sacrifice, but I prefer the work," she said. "There is tremendous satisfaction in it. It's really compelling."

Is there another job in the offing for Cole? "You never know what Apple has in store for you," she said.

From One-Woman Show to Full House

One thing that Jean Richardson has seen at Apple is the phenomenal growth of her department. That expansion naturally followed the mushrooming of the company itself.

When Richardson began at Apple five years ago as the director of marketing communication, she was a department of one whose job was to oversee all the corporation's advertising except in the European market. Her job still is the same, but she now has a staff of more than 100.

It's almost like being in Hollywood.

Doubly interesting is that Richardson knew nothing about computers when she accepted the job, but she was personally interested in the computer's impact on society. Before coming to Apple Computer, she had been a housewife and never had worked steadily outside the home.

Richardson sought out Apple after reading a newspaper article about founders Steve Jobs and Steve Wozniak and how they got their company started. She thought the story about two young men working out of a garage was compelling and their ideas about business intriguing. She saw this effort, which has since become the growing Apple Computer, Inc., as a place to genuinely excel.

"The product looked good. A glimpse of the people was good," she explained, recounting the impression left by the article. "It sounded like the company I wanted to work for."

Most women, or most Apple employees for that matter, have worked full time before joining the company. Some have backgrounds only in unrelated fields, but others grew into jobs through other experience in the computer industry.

JuLee Friedeck, now a national account executive at Apple, worked for computer giant IBM before her Apple days but prefers the smaller, less-structured company where opportunities are greater. Her present job is to sell Apple products to Fortune 1000 companies.

"Within the 1000, I specialize in banking, brokerage, and the oil industries," she said. "I came to Apple because I had the chance to be the first national account representative in Northern California. Anytime you can be the first to do something, I believe you should do it."

She does have a gripe though: "The only complaint I would have is that there are not enough hours in a day to communicate to the many corporations the value of utilizing a computer to increase productivity."

All That Pizzazz

To Karin Blomstrand, once a DEC employee, being at Apple is like working in Tinsel Town.

"It's the only place I've worked that really grabs me," she said. "People want to see [the products] hit the market. It's almost like being in Hollywood—all that pizzazz," she said.

Now the manager of software development for PCS, the 37-year-old Blomstrand manages a department of 34. Two-thirds of her staff write software, and the rest do research and testing.

Blomstrand agrees that the enthusiasm comes in part from the age of the company and its employees. "It's a very young company run by young people," said Blomstrand. She believes Apple would be a different place if it were dominated by older employees.

Yet, those older employees offer a valuable perspective. "They have a sense of the industry as a whole," she said. "They have a broader view. It's less focused on a specific hot item. We have seen attempts and we have seen what things work well. I think you learn. Experience has that value." ✚

ProDOS

First there was the Apple DOS, then there was Apple SOS, now there's ProDOS.

In 1983 Apple introduced two exciting products—first, the Apple IIe, and now ProDOS, a new operating system for the Apple II family.

ProDOS represents a significant advance over previous Apple II operating systems. Both programmers and users will benefit from its advanced features: hierarchical file management, support of mass storage devices and interrupt-driven processes, and compatibility with the Apple III Sophisticated Operating System (SOS).

Currently ProDOS is being licensed to software developers for applications development only. "Software developers have expressed great interest in a standard operating system for the Apple II that provides advanced capabilities for such applications as networking, business graphics, and large database management," says Bill Schjelderup, ProDOS product marketing manager. "ProDOS is our response to this need."

This means that more sophisticated applications software—programs that require mass storage and interrupts—will be available for the Apple II. Users will find that programs run faster because of ProDOS's more efficient memory and file management. And because ProDOS shares data formats and file-naming conventions with Apple III's Sophisticated Operating System (SOS), data files and media can be interchanged between the Apple II and Apple III.

MORE SPACE

The impetus behind ProDOS was to make it possible for the Apple II to support mass storage beyond the 140 kilobytes provided by the Apple II disk drive. It had become apparent that the Apple II could support data communications and networking as well, tasks that DOS 3.3 wasn't prepared to handle because it lacked interrupt capabilities.

The ProDOS development team, engineers who had been working with Apples since the Apple II was invented, decided that a new operating system should allow for these capabilities.

What resulted, after almost three years of research and development, was a completely new operating system, not a modified DOS 3.3. ProDOS runs on any Apple II with at least 64K of memory (any Apple IIe, or an Apple II or Apple II Plus with 48K RAM and a language card). When Applesoft BASIC is required, the Applesoft ROM must be installed on the motherboard (as it is on the Apple II Plus and the Apple IIe).

ProDOS contains all the features of Apple III SOS while maintaining as much compatibility as possible with DOS 3.3 in the Applesoft BASIC environment. In fact, from an assembly-language programmer's viewpoint, ProDOS looks very much like the Apple III SOS. For an Applesoft BASIC programmer ProDOS will do a lot more than DOS 3.3, yet the great majority of DOS commands will work identically.

ProDOS FEATURES

The main features of ProDOS include its hierarchical filing system, support of mass storage devices, compatibility with Apple III SOS and DOS 3.3, and support of a defined interrupt protocol.

Hierarchical Filing System

ProDOS organizes information in a hierarchical filing structure. This allows you to keep files in subdirectories and organize your stored data better than in a single-level directory structure. Several other operating systems, such as Apple III SOS, UNIX, and PC-DOS 2.0, also use this filing structure.

The hierarchical filing system keeps track of data stored on a disk, just as you would store papers in folders in a filing cabinet. The folders are analogous to subdirectories, and the papers in those folders are analogous to files in the subdirectories. Because of this organization, information stored on your disk can be retrieved very quickly. When you request the operating system to get a file, it doesn't have to search through hundreds of files in the directory. It simply searches through several subdirectories until it finds the one you want.

Mass Storage

ProDOS allows the Apple II to handle large files—up to 16 megabytes in size. And the hierarchical filing structure provides the hard-disk user with an organized method for managing large numbers of files.

Suppose you had a 5-megabyte hard disk attached to your Apple II. DOS 3.3 would not allow you to store on it a file larger than 140 kilobytes (the size of a DOS-formatted floppy disk). ProDOS frees you from this constraint and, with its hierarchical filing structure, provides an efficient method for storing data.

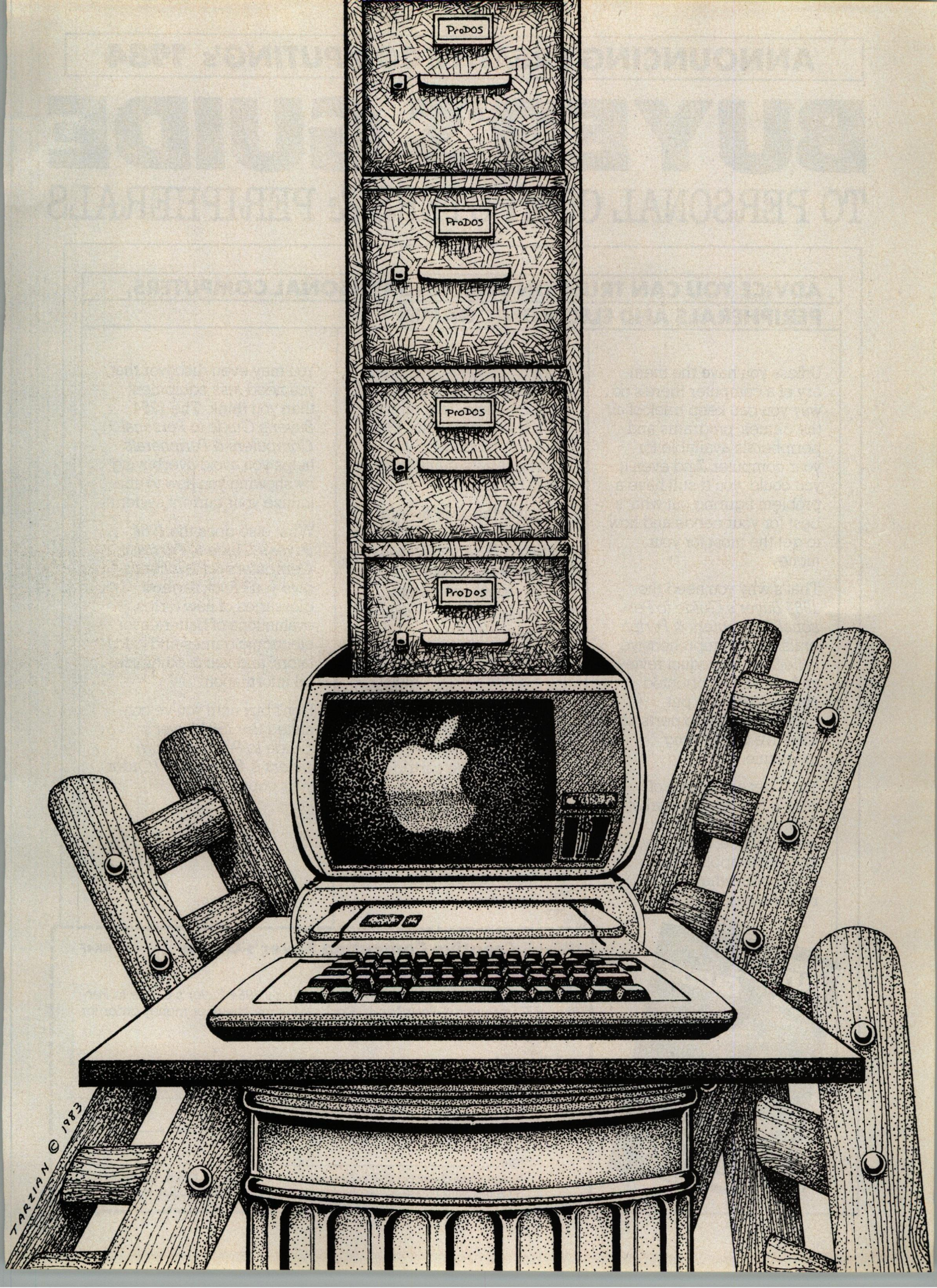
The hierarchical filing system keeps track of data stored on disk, just as you would store papers in folders in a filing cabinet.

Apple III SOS Compatibility

Because ProDOS uses the same file structure and data formats as Apple III SOS, a true Apple II and Apple III family tie has been created. ProDOS data files saved on an Apple II may be used by an Apple III. This compatibility means that you can use your Apple IIe at home to type a memo (using the ProDOS-based word-processing program) and edit it on the Apple III at your office (using a SOS-based version of the same program).

DOS 3.3 Compatibility

ProDOS is also compatible with DOS 3.3. When you run Applesoft BASIC under ProDOS, you can use most of the DOS 3.3 commands. There are a few


ProDOS
ProDOS
ProDOS
ProDOS
TARZIAN © 1983

ANNOUNCING *CREATIVE COMPUTING*'s 1984

BUYER'S GUIDE

TO PERSONAL COMPUTERS & PERIPHERALS

ADVICE YOU CAN TRUST ON SELECTING PERSONAL COMPUTERS, PERIPHERALS AND ELECTRONIC GAMES

Unless you have the memory of a computer there's no way you can keep track of all the games, programs and peripherals available for your computer. And even if you could, you'd still have a problem figuring out what's best for your needs and how to get the most for your money.

That's why you need the *1984 Buyer's Guide to Personal Computers & Peripherals.* It's a comprehensive collection of product reviews and consumer-oriented shopping advice put together by the experts at *Creative Computing* magazine.

You'll get a rundown of what's new on the market. Analysis of new product performance, reliability, operation, applications, cost—even what kind of repair service you can expect. Easy-to-understand comparisons between different models. Tips on bugs and design problems. Plus "inside" information you won't get from manuals or sales people.

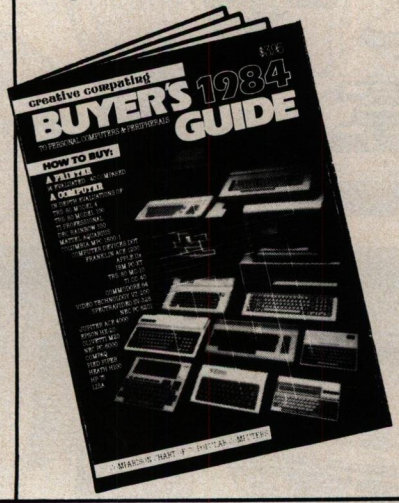
Plug into the *1984 Buyer's Guide to Personal Computers & Peripherals* and find out what's hot in...

- ☐ Personal computers
- ☐ Pocket-sized computers
- ☐ Telecomputers
- ☐ Disk drives
- ☐ Memory expanders
- ☐ Word processors
- ☐ Dot matrix printers
- ☐ Electronic games
- ☐ Video game cartridges
- ☐ Joysticks and paddles
- ☐ Game port extenders
- ☐ Color graphics boards
- ☐ Speech synthesizers
- ☐ Do-it-yourself kits
- ☐ And more

You may even discover that you need *less* equipment than you think. The *1984 Buyer's Guide to Personal Computers & Peripherals* helps you avoid overbuying by showing you how to customize your current system.

What else does the *1984 Buyer's Guide to Personal Computers & Peripherals* give you? Book reviews, glossaries of new terms, evaluations of batteries for electronic games and calculators, and lots of other useful information.

Don't buy until you've consulted the *1984 Buyer's Guide to Personal Computers & Peripherals!* Order your copy today.



Send to: **Creative Computing Buyer's Guide** NK4F
CN 1914, Morristown, NJ 07960

Yes! Please rush me Creative Computing's *1984 Buyer's Guide to Personal Computers & Peripherals.* Enclosed is my check or money order for $3.95 plus $1 for postage and handling.

Mr./Mrs./Ms._____
(please print)

Address_____

City_____

State_____ Zip_____

Please make check payable to Creative Computing Buyer's Guide. CA, NJ and NY State residents please add applicable sales tax. Price outside U.S.A. is $6.

commands ProDOS does not support, such as INIT, MON, and NOMON, but other commands are new or enhanced under ProDOS. The Applesoft BASIC under ProDOS is also significantly enhanced (see figure 1).

ProDOS FOR SOFTWARE DEVELOPERS AND USERS

As a result of ProDOS, more advanced applications software, which can take advantage of larger data storage and interrupt capabilities, will become available for the Apple II. These include local-area networking, data communications, animation, word processing, spreadsheets, and other highly interactive applications.

Software developers who have used ProDOS are enthusiastic. "What interested me in ProDOS," says Greg Mainis of Desktop Computer Software, "was that it's an upgraded system from DOS 3.3, has a hierarchical filing structure, and contains some improved commands." Mainis recently transferred Graph'n'Calc to the ProDOS environment. (As a decision-support graphics package that works in conjunction with spreadsheets and databases, Graph'n'Calc performs sophisticated statistical calculations that cannot be programmed onto a spreadsheet.) "Graph'n'Calc is a big program, and some of the features of ProDOS were perfect for it," he says.

ProDOS also supports the extra 64K of RAM on the Apple IIe's extended 80-column card as a separate volume. "What we've done is taken all the graphics and, if the user has a 64K expansion board, we just load it up into RAM. This allows us to load graphic screens with blinding speed," Greg says.

ProDOS data files saved on an Apple II may be used by an Apple III.

Converting Applesoft BASIC programs under DOS 3.3 or 6502 assembly-language programs to ProDOS is fairly straightforward. Applesoft programs usually require little or no change, while assembly-language programs require reworking of disk-access routines. Users will now be able to convert DOS 3.3 data files to work with ProDOS-based application programs to take advantage of the capabilities that ProDOS provides. ✚

	DOS 3.3	SOS	PRODOS
APPLE LANGUAGES SUPPORTED	APPLESOFT BASIC 6502 CODE INTEGER BASIC	BUSINESS BASIC 6502 CODE PASCAL III	APPLESOFT BASIC 6502 code
MAXIMUM VOLUME SIZE	0.140M	32M	32M
MAXIMUM PHYSICAL FILE SIZE	.362M	16M	16M
DIRECTORIES PER VOLUME	ONE	UNLIMITED	UNLIMITED
FILES PER VOLUME	105	UNLIMITED	UNLIMITED
DIRECTORY ACCESS METHOD	SEQUENTIAL	SEQUENTIAL	SEQUENTIAL
FILE ACCESS METHOD	SEQUENTIAL	B-TREE	B-TREE
NUMBER OF INTERRUPT VECTORS	NONE	4, NESTED	4, SEQUENTIAL

Figure 1: Operating Systems Comparison Chart for ProDOS, DOS 3.3, and SOS.

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION (Required by 39 U.S.C. 3685)

1. Title of Publication: A+
   a. Publication No. 07401590
2. Date of filing: October 1, 1983
3. Frequency of issue: Monthly
   a. No. of issues published annually: 12
   b. Annual subscription price: $24.97
4. Location of known office of publication: One Park Avenue, New York, New York 10016.
5. Location of the headquarters or general business offices of the publishers: One Park Avenue, New York, New York 10016.
6. Names and complete addresses of the publisher, editor, and managing editor: Publisher: Sydney H. Rogers, One Park Avenue, New York, New York, 10016; Editor: Maggie Canon, One Park Avenue, New York, New York 10016; Managing editor: Leslie Steere, One Park Avenue, New York, New York 10016.
7. Owner: Ziff-Davis Publishing Company, One Park Avenue, New York, New York 10016; Ziff Corporation, One Park Avenue, New York, New York 10016.
8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities: None.
10. Extent and Nature of Circulation:

	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total no. copies printed (net press run)	153,884	153,884
B. Paid circulation		
1. Sales through dealers and carriers, street vendors and counter sales	61,300	61,300
2. Mail Subscriptions	38,600	38,600
C. Total Paid Circulation (sum of 10B1 and 10B2)	99,900	99,900
D. Free distribution by mail, carrier or other means, samples, complimentary, and other free copies	13,242	13,242
E. Total distribution (sum of C and D)	113,142	113,142
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	3,552	3,552
2. Returns from news agents	37,190	37,190
G. Total (sum of E, F1, and 2 —should equal net press run shown in A)	153,884	153,884

11. I certify that the statements made by me above are correct and complete.

WILLIAM L. PHILLIPS,
Assistant Treasurer

IIe OR NOT IIe?

Sams answers all your questions.

Sams introduces two new books on the new Apple IIe® computer. So if you're new to Apple IIe programming, Sams has the answers you've been looking for.

For a detailed understanding of Applesoft programming, start with APPLESOFT FOR THE APPLE IIe. Brian and George Blackwood, authors of Sams APPLESOFT LANGUAGE, wrote this book especially for new Apple IIe owners. Read it and you'll quickly learn Applesoft syntax, programming techniques, commands, functions, and more. You get all this for only $19.95. And that's a value you won't find in any other IIe Applesoft book around.

Sams APPLE IIe PROGRAMMER'S REFERENCE GUIDE is a must for IIe owners of all experience levels. It provides quick answers to your day-to-day programming questions. And includes short applications and demonstration programs written in Apple BASIC and 6502 assembly language. Written by David L. Heiserman.

So when it comes to your Apple IIe questions, Sams answers with APPLESOFT FOR THE IIe, No. 22259, $19.95, and APPLE IIe PROGRAMMER'S REFERENCE GUIDE, No. 22299, $19.95.

Buy yours today! Or call Operator 470 at 317-298-5566 or

800-428-SAMS

SAMS™

Howard W. Sams & Co., Inc.
4300 West 62nd Street • P.O. Box 7092 • Indianapolis, IN 46206

Offer good in U.S.A. only. Prices subject to change without notice. In Canada, contact Lenbrook Electronics, Markham, Ontario L3R 1H2.
Apple IIe is a registered trademark of Apple Computer, Inc.

AD470

CIRCLE 272 ON READER SERVICE CARD

▸ TUTORIAL/BY ROBERT COWART

HOW TO dBASE II

PART III

In a tutorial series on dBase II, a popular program for database management.

In some of the examples in this tutorial, the command lines (the part you type) are too long to fit in one of our typeset column lines. Unless a <CR> indicates a carriage return, do not insert one. Rather, just type the command as one line terminated by a <CR>.

So far in this series of dBASE II tutorials, we've covered techniques for creating databases and storing information in them. The last issue also introduced some methods for data retrieval. This time, we'll explore more efficient means for interactive data retrieval, along with approaches for general database maintenance.

If this is your first copy of *A+*, you can catch up somewhat in this series by creating a database called PHONEBK with the structure listed below. (See your dBASE II manual for details on the Create command.)

Make sure that you include the data records here for use with some of the examples later on.

```
STRUCTURE FOR FILE:   A:PHONEBK.DBF
NUMBER OF RECORDS:    00000
DATE OF LAST UPDATE:  00/00/00
PRIMARY USE DATABASE

FLD        NAME       TYPE  WIDTH  DEC
001      first:name     c      010
002      last:name      c      015
003      street         c      022
004      city           c      013
005      state          c      002
006      zip            c      005
007      phone          c      012
** TOTAL **                    00079

first:name  :WACKFORD  :
last:name   :SQUEERS         :
company     :RALPH NICHOLBY INC.  :
street      :374 TIPPLEMEYER AVE  :
city        :CORNMONT     :
state       :CA:
zip         :94709:
phone       :415-555-1111:
work:phone  :415-555-1212:

first:name  :NIMROD
last:name   :NEVERBURGER      :
company     :BABS' FISH N CHIPS  :
street      :77 EASY STREET       :
city        :COZAD         :
state       :CA:
```

from the publishers of PC

PCjr. For IBM Personal Computers in Education, Home and Business Use

THE NEW FOUNDATION FOR IBM PERSONAL COMPUTERS

PCjr. For IBM Personal Computers in Education, Home and Business Use

P.O. BOX 2450, Boulder, Colorado 80322

8H179

YES, please enroll me as an Introductory Subscriber to PC JR. for:

- ☐ One year (12 issues) $14.97 and SAVE 25%
- ☐ Two years $27.97 and SAVE 30%
- ☐ Three years $38.97 and SAVE 35%

Mr/Mrs/Ms_____
please print name in full

Address_____

City_____ State_____ Zip_____

CHECK ONE: ☐ Payment enclosed ☐ Bill me later
Charge My: ☐ American Express ☐ Visa ☐ MasterCard

Card No._____ Exp. Date_____

Savings based on full one-year subscription price of $19.97.
Please allow 30 to 60 days for delivery of first issue.

Fulfill all of your expectations for your IBM personal computer with PCjr., the applications magazine written for you and your household! Whether you're completing your banking from home, cataloging your book, record or recipe collections, teaching your pre-schooler math or the alphabet, preparing your taxes or term papers, or just playing games, PCjr. will enable you to get the most out of all IBM PC's or compatible computers!

PCjr. is written for all members of your household as a tool to utilize your computer to its fullest extent.

SUBSCRIBE TODAY AND SAVE UP TO 35%!

```
zip           :89751:
phone         :717-555-1597:
work:phone    :717-555-7951:

first:name    :ADRIATOR
last:name     :BEDWAX              :
company       :RUG FLOX INC.       :
street        :158 SNOREWELL BLVD. :
city          :SLEEPYHOLLOW:
state         :CA:
zip           :02587:
phone         :207-555-7014:
work:phone    :207-555-4107:
```

Those of you who have been following along in the past two issues should take a moment to double-check your structure too.

Tutorial Conventions

Just to differentiate between what you type and what dBASE II responds with, the lowercase words are the ones you type. Uppercase works too, so it doesn't really make a difference—it's just clearer this way. Some examples may have you type uppercase letters also, but they always involve a series of words between quotation marks. The dBASE II responses are in uppercase letters. The <CR> means to press the carriage-return key.

Getting Started Again

To bring up dBASE and open your Phonebk file, type

```
A> dbase <CR>
```

Then fill in the date and press Return. When you get the dot prompt, type

```
. use phonebk <CR>
```

As you may remember, the Use command tells dBASE II to open any file you stipulate. In this case, it is your Phonebk file. Next, type

```
. display structure <CR>
```

You should now see your Phonebk file's structure as it appears in the example beginning on page 159.

Last time, you experimented with the Display command quite a bit. Using that command, it was fairly easy to list

Don't be alarmed if you hear lots of disk access going on. This is the result of dBASE II analyzing every record.

whatever information you wanted, based on a particular field. For example, you listed all California residents in your database by typing

```
. Display for state=''CA'' <CR>
```

The Display command is much like the List command, except that it shows you only 15 records at a time. The List command scrolls information off the screen unless you manually stop it with a Control-S.

Suppose you want to do more than just list streams of data. Perhaps you want to position the dBASE II pointer on a specific record and then edit (make some changes in) that record, or maybe just display that particular record by itself.

You can accomplish this and many other manipulations of specific records with the help of the Locate command.

If you happen to know the approximate vicinity of the record you are searching for, the Next clause can limit this aggravation.

Locating Specific Records

The Locate command works like this. By using a "for" phrase (just as with Display) after the Locate command, you cause dBASE II to start at the top of your database (GOTO TOP) and search for the first record that meets your requirements. dBASE II reports only the record number and waits for you to do something. The record-number pointer remains positioned on the chosen record. If no records contain the data you are looking for, dBASE II responds with END OF FILE ENCOUNTERED.

Why not try using the Locate command yourself? Assuming you have the dBASE II dot prompt, type in the following (be sure to use uppercase where indicated):

```
. locate for last:name=''SQUEERS'' <CR>
  RECORD 0125     ←  or some other number
```

Your record number is probably different from this one, but, in any case, your record-number pointer should now be positioned on Wackford Squeers' data. Typing

```
. display first:name, last:name, phone <CR>
```

should get you

```
0125 WACKFORD SQUEERS 415-555-1111
```

Simply typing

```
. display <CR>
```

will show you all the information in the current record.

In order to see if any more poeple in your database have the last name Squeers, type

```
. continue <CR>.
```

This command repeats the search, starting at the current pointer position, rather than at the top of the database. If another Squeers shows up, you can display that record in the same way as before.

If your database is large, a Locate command may result in a time-consuming search. Don't be alarmed if you hear lots of disk access going on. This is the result of dBASE II analyzing every record, one at a time, in order to determine which records fit your search requirements.

If you happen to know the approximate vicinity of the record you are searching for, the Next clause can limit this

Educational News

Orange Plus Educational News located at 23801 Calabasas Road / Suite 2050 / Calabasas, CA 91302 / (213) 999-5210

Legal Apple[Type] Compatible

New Computer runs CP/M & Apple[Type] Software

CALABASAS - Now instructors can teach Apple-type programs such as LOGO in one class and professional-style word processing in another without any hardware changes. Dual microprocessors (Z80-A & 6502, two computers in one case), with the radical new Orange Plus development, the "EuroROM", allows the machine to read/write/work with Apple-type software as well as CP/M programs and access either CPU via the keyboard.

The ***"ORANGE+TWO"***™ is a brand new direction in the evolution of the personal computer. ORANGEFORTH-83, a derivative of Fig-FORTH — a readily available public domain language, is resident in ROM*. Also included is CP/M 3.0, Digital Research's latest CP/M version. There is also a built-in disk drive controller for two Apple-type drives, a cassette interface, joystick port, color graphics and ASCII keyboard with numeric keypad. For expert word processing, the keyboard features upper and lower case (lower case characters are true descenders) with auto repeat.

This new breed of computer is a break-through for educators and school systems throughout the world. The ability to run both Apple-type and CP/M software on the same machine relieves financially-pressed educators from expensive equipment burdens, allowing them to spend more money where it counts... **on the teachers.**

*Available on disk at extra cost.

Orange Plus Koala Pad

With the touch of your finger, the Orange Plus Koala Pad (Touch Tablet with Micro Illustrator) takes control of your computer to create beautiful, high-resolution computer graphics. Finally, a full-featured graphics tablet at an affordable price.

MORE FOR LESS

The ***"ORANGE+TWO"***™ 64K computer includes these standard features:

Built-in CP/M 2.2 ..... **n/c**
Digital Research's CP/M 3.0 ..... **n/c**
Built-in disk drive controller card for two Apple-type drives ..... **n/c**
Numeric keypad with separate return key ..... **n/c**
110/220 volt switch selectable power supply, 50-60 Hz ..... **n/c**
Full function ASCII keyboard with auto repeat ..... **n/c**
Cassette Interface ..... **n/c**
Grounded metal base plate ..... **n/c**
Adjustable audio volume ..... **n/c**
ORANGEFORTH-83, Z80-A FORTH language, resident in ROM ..... **n/c**
Z80-A CPU, a 2nd computer ..... **n/c**
6 slot two-sided logic board ..... **n/c**
Bank switchable RAM, fully socketed, expands to 256K ..... **n/c**
Programmable 2764 EPROMS ... **n/c**

TOTAL
"ORANGE+TWO"™ **$1295.00**

Compare the features included in the ***"ORANGE+TWO"***™ *with the competition's and you will find that most competitors are priced over $2,000.*

MORE PRODUCTS FROM ORANGE+ COMPUTER SYSTEMS

Disk-based ORANGEFORTH-83 language with full documentation
$99.95

Digital Research's™ CBasic with disk and documentation
$49.95

Orange Plus KoalaPad™ Touch Tablet w/Micro Illustrator™
$124.95

Orange Plus Joystick (works on "ORANGE+TWO", Apple II, II+ & IIe)
$29.95

Orange Plus Self-Centering Joystick
$39.95

10MB (Formatted) 5¼" half-height Winchester Hard Disk Drive
$1495.00

Controller & Interface for Hard Disk**
$395.00

**Includes everything necessary to be installed in "ORANGE+TWO", Apple or Franklin Computer

The above are suggested retail prices. Prices may vary from state to state.

Collins International Trading Corporation
23801 Calabasas Road, Suite 2050 / Calabasas, CA 91302
(213) 999-5210

CIRCLE 160 ON READER SERVICE CARD

aggravation. Let's say you wanted to check only the next 100 records for a particular person. The syntax would be as follows:

```
. locate next 100 for last:name=''SQUEERS''
  <CR>
```

You can also use the Continue command here, but when dBASE II gets to the end of the 100 records it is searching, the message END OF LOCATE SCOPE will appear.

Editing Your Data

No useful phone and address book can be carved in stone. People seem to enjoy moving around, and acquiring new addresses, phone numbers, jobs, and pets. In anticipation of

The Browse command can display up to 19 records on the screen at a time.

the ever-changing nature of most databases, dBASE II allows you to edit your data records easily. This flexibility is particularly nice in the case of our "phonebk." Unlike handwritten, personal phone books, databases don't have the mess of crossed out numbers or pages worn out by multiple erasures for your *really* transient friends.

You use the Edit command in much the same way as Append, but for editing, dBASE II needs to know the number of the record you desire to modify. Incidentally, Edit is one of the few commands that calls for a record number.

For example, to edit record number 10, you can simply type

```
. edit 10 <CR>
```

The contents of record number 10 should appear now, just as they did during the Append process. You can use the control codes listed below to move the cursor around and change the data. (The ^ sign means to hold down to Control key while pressing the designated letter key.)

```
RETURN  Moves cursor to next field
    ^X  Moves cursor one field ahead (same
 as RETURN)
    ^E  Moves cursor one field back
    ^D  Moves cursor one space ahead
    ^S  Moves cursor one space back
    ^C  Moves forward to the next record in
 your database
    ^R  Moves backwards to the previous
 record
    ^Y  Erases field contents (press
 twice)
    ^V  Toggles Insert mode on/off
    ^G  Erases character at cursor
 position
    ^U  Marks the record for later deletion
 from file
    ^W  Saves all changes and returns you
 to the prompt
    ^Q  Leaves all records unchanged and
 returns to prompt
DELETE  Deletes the character to the left of
 the cursor
```

Go ahead and try to edit one of your records. Even if you accidentally change all the data in it, you can tell dBASE II to revert to the previous version (undo your changes) by typing ^Q. This procedure returns you to the dot prompt and exits from the Edit mode. Just pressing <CR> at the bottom of one record doesn't get you out of Edit—it advances you to the next record. Make sure to type ^W (for *write*) to get out of Edit and save your changes.

In most cases, you won't know the number of the record you want to edit. This is when the Locate command, followed by a modification of the Edit command can come in handy:

```
. locate for last:name=''SQUEERS'' <CR>
RECORD 0125 ← or some other number
. edit # <CR>

first:name  :WACKFORD  :
last:name   :SQUEERS   :
company     :RALPH NICHOLBY INC.  :
street      :374 TIPPLEMEYER AVE  :
city        :CORNMONT     :
state       :CA:
zip         :94709:
phone       :415-555-1111:
work:phone  :415-555-1212:
(Type ^Q to get out.)
```

What happened? Actually, this is a good trick to remember. You are already familiar with the first command. It merely positioned the pointer on the record you wanted to change. Then it was a simple matter to tell dBASE II, "OK, let's edit it!" The # sign, as you may recall from the ? # command, is the record-number function. Typing *edit #* just means "edit whichever record the pointer is now on." *Edit record 125* would have worked just as well, but *edit #* is easier.

Browse—the Movable Window

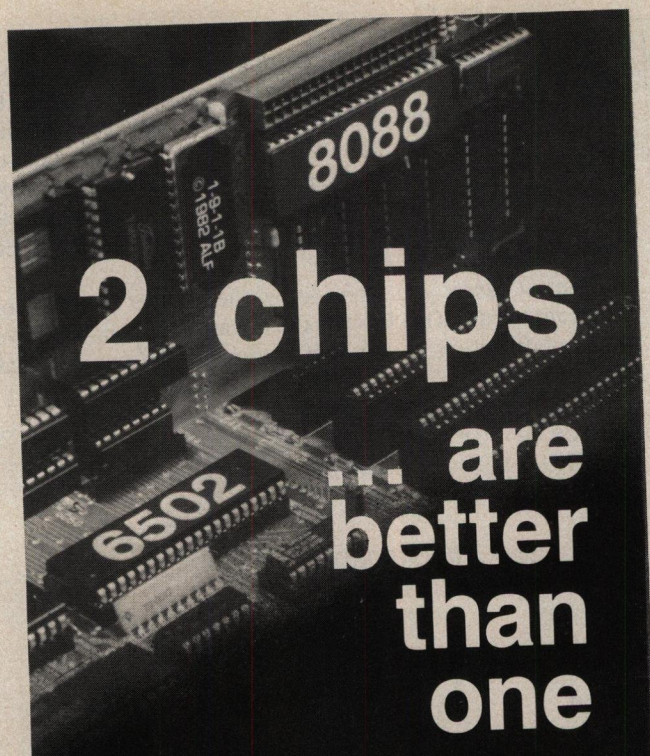
Another dBASE II command can make updating your data a bit easier. It's called Browse and is in reality a powerful command for viewing and editing. It lets you scan through your database as though you were reading a newspaper with a magnifying glass. This command lays out a table of rows and columns on your screen as though your database were on grid paper. Using control codes, you can pan backwards and forwards through your records, as well as right and left through your fields.

In anticipation of the ever-changing nature of most databases, dBASE II allows you to edit your data records easily.

The Browse command can display up to 19 records on the screen at a time, with one record per line. The number of fields shown at one time varies, depending on their length. You can edit data and delete records by using the normal full-screen editing codes.

With that in mind, try browsing through your Phonebk file. Just type

```
. browse <CR>
```



2 chips ... are better than one

Is your Apple's 6502 processor chip a little overworked lately? Have you been eyeing one of those new, 16-bit systems? But you don't want to give up all your Apple programs ...

Add the powerful 16-bit 8088 processor to your Apple with ALF's Processor Card. Let the 6502 and 8088 work together to tackle your toughest problems—like speeding up your Applesoft and Apple Pascal programs. With the Processor Card, you can use the CP/M™ 86 or MS-DOS™ operating system to run the latest 16-bit software, including many IBM PC programs.

64K or 128K of high-speed memory is available for ALF's Processor Card. Use the Processor Card with 128K as a fast disk emulator or to view sixteen hi-res images in under a second. Or run Basic, C, COBOL, or Pascal with 16-bit performance!

The ALF Processor Card is just $395 (Applesoft speed-up software included). See your Apple dealer today, or contact ALF for more information.

Trademarks: "Apple": Apple Computer, "CP/M": Digital Research, "MS-DOS": Microsoft.

ALF

ALF Products Inc.
1315F Nelson St. Denver, CO 80215
(303) 234-0871 Telex: 4991824

Now you should see a matrix of columns and rows. Use the following codes to move around:

```
^A  Left one field
^F  Right one field
^S  Left one letter
^D  Right one letter

^R  Save record and back up one record
^C  Save record and move to next record

^B  Pan the window right
^Z  Pan the window left

^W  Save record and exit
^Q  Exit without saving changes in current
    record only
```

A few notes about the Browse command are in order. A field will not appear on the screen unless all of it can fit. You may have to pan left or right several times to get a display of some larger fields. Also, the ^Q and ^W commands apply only to the record you are currently on. Once you type ^C or ^R, the record you were on is saved as you left it. In other words, if you mess up a bunch of records and then type ^Q, thinking that none of your changes will be saved, you are in for a surprise.

Replacing Specific Field Data

What if all you want to change is the data in one specific field? Isn't there an easier way than using the Edit command and all those control codes? Yes. You can use the Replace command.

As with Edit, you can use this command with the record

Beware that this command will modify the street address of all Neverburgers in your database, not just the first one. This is an example of the type of command that can wreak havoc on your database if you aren't careful.

number in mind, or you can use a slightly longer syntax if you don't know the record number. Say Nimrod Neverburger moved from 77 Easy Street to 33rd & 3rd Street and you wanted to record this change. Can you think of several ways to do it? Try it yourself. Then, if you get stuck, use these commands (remember that your record numbers will be different):

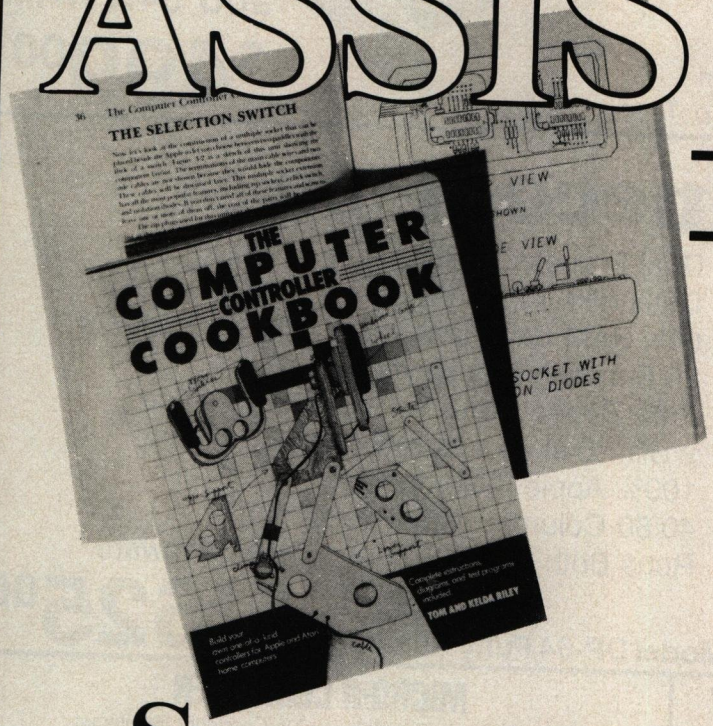
```
. locate for first:name=''NIMROD''<CR>
RECORD 00126
. replace street with ''33rd & 3rd
    Street''<CR>
000001 REPLACEMENT(S)
```

The first command positions the dBASE II pointer on Nimrod's record. The second one changes the data in the Street field.

To achieve the same result with one command, you could have used the "for" phrase to tell dBASE II to look through

THE DO-IT-YOURSELFERS' PROJECT ASSISTANT

BY TOM & KELDA RILEY



Save up to half the usual retail price building your own game controls that will last up to twice as long as most commercially purchased models with THE COMPUTER CONTROLLER COOKBOOK...the indispensible guide for computer game enthusiasts!

Make your own game controls...repair that old joystick that's been sitting in your closet...have your own project assistant in your home, ready when you are! The COMPUTER CONTROLLER COOKBOOK gives you complete schematics and mechanical drawings for building and repairing joysticks, paddles and game devices for your Apple® or Atari® computer, with a special section showing you how to adapt these to most major machines. Imagine building your own Super Joystick, Annunciator, Airplane Wheel, Foot Pedals, Sketch Pad or Multiple Connector from purchased *and* scavenged parts and then using them on your own computer! Imagine saving up to half the cost of usual commercial prices and having your controls last up to twice as long! Imagine the hours of enjoyment and learning you'll get from the COMPUTER CONTROLLER COOKBOOK!

Order your copy today!

Apple is a registered trademark of Apple Computer Inc. Atari is a registered trademark of Atari Inc.

CREATIVE COMPUTING PRESS Dept. NK2F, 39 East Hanover Avenue, Morris Plains, NJ 07950

Please send me _____ COMPUTER CONTROLLER COOKBOOK(s) at $11.95* plus $2.00 postage and handling each. Outside U.S.A. add $3.00 per order. #8C.

☐ Payment enclosed $_____. *Residents of CA, NJ, and NY State add applicable sales tax.

☐ **Charge my:**
☐ American Express ☐ Visa ☐ MasterCard

Card No._____ Exp. Date_____

Signature_____

Mr./Mrs./Ms._____
please print name in full

Address_____

City_____

State_____ Zip_____

For faster service, PHONE TOLL FREE
1-800-631-8112
(In NJ call 201-540-0445)

☐ Send me a FREE Creative Computing Press Catalog.

FORMULA INTERNATIONAL INC.

12603 Crenshaw Blvd., Dept. B, Hawthorne, CA 90250

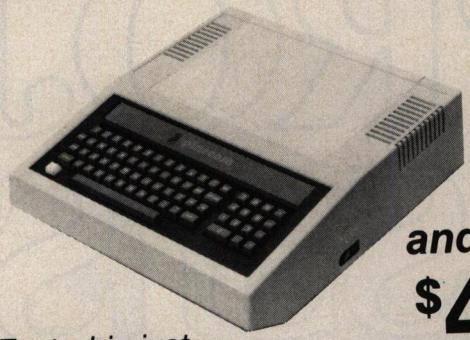
For information (213) 973-1921 • Orders Only (outside Calif.) (800) 672-8758

pinecom™ Pioneer of Low Cost Apple* Compatible Computer

No Copyright Infringements!

Compare These Features with Our Competitors:

- Powerful Utility Program (100% Apple Compatible)
- 68-Key Upper & Lower Case Keyboard with Numeric Keypad
- 25 Pre-programmed Function Keys
- 2 Speed Auto Repeat Funtion
- 64K User Memory—expandable to 192K
- 5A Switching Power Supply (110/220VAC)
- All ICs Are Socketed for Easy Service
- Nation-wide Dealer Network for Convenient Technical Support



Now with New Improved Keyboard and 64K RAM

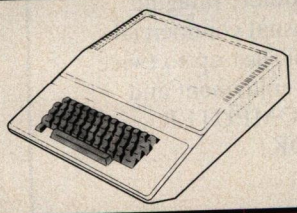
And best of all, the price Assembled and Tested is just. **$499.00**

NEW

pinecom™ DP-64

- Dual Processor (6502 and Z80A)
- Detached Keyboard
- 64K RAM Expandable to 192K
- 25 Function Key Keyboard
- Auto Repeat Keys w/Upper/lower Case
- 2 Slim Disk Drives (optional)
- 100% Apple II Compatible
- 40/80 Column Display (optional)
- Runs Both Apple Soft and CP/M Software

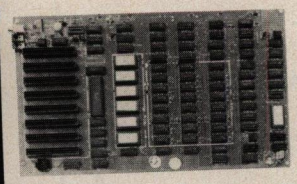
Model DP-64 Fully Assembled . . . $625.00



AP-II COMPUTER A&T

Apple Look Alike
48K User Memory
Supports Upper & Lower Case
100% Apple II* Compatible

$445.00



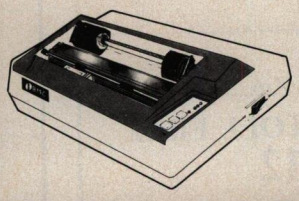
AP-II MOTHERBOARD

Apple II+* Compatible
48K Memory Space
8 Expansion Slots

Bare Board . . . . . **$69.95 ea.**

Assembled &.Tested . . . . **$295.00 ea.**

PRINTER by BMC

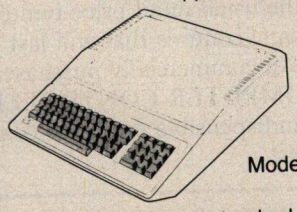


Parallel Interface (Centronics Compatible) Standard
Microprocessor Electronics
80cps Bidirectional with Logic Seeking
96 Character ASCII
Adjustable Sprocket and Friction Feed

Model BX-80 . . . . $265.00

MICRO-II COMPUTER

100% Apple Compatible • No Copyright Problems!



Model I 48K RAM **$475.00**

Model II 64K RAM **$499.00**

Model III 64K RAM w/Dual CPU . . **$545.00**
(6502 for Applesoft & Z80A for CP/M)

All above models are standard with Numeric Keypad, Function Keys, Auto Repeat Keys, Upper/lower Case Function, Fully Assembled and Tested.

PERIPHERALS

Autoterm 80-Col. w/Softswitch	$99.95
80-Column Card	99.95
80-Column for Apple IIe*	49.95
Z80 CP/M Card (no software)	99.95
16K RAM Card	49.95
Parallel Printer Interface	85.00
Buffer for Printer Interface (16-64K)	85.00
Serial Printer Interface Card w/Adj. Baud	85.00
Disk Controller	65.00
Disk Controller DOS 3.2/3.3 Auto Select.	75.00
EPROM Writer Card (2716/2732/2764)	75.00

★ SEND ★ ONE DOLLAR FOR OUR DETAILED CATALOG

SEND ONE DOLLAR FOR OUR DETAIL CATALOG

Inside California
Outside Calif. (incl. Mexico & Canada)
Overseas

Shipping & Handling Charges	Under $50.00 Purchase	Over $50.00 Purchase
Inside California	10%	5%
Outside Calif. (incl. Mexico & Canada)	15%	10%
Overseas	25%	20%

Minimum Order $10.00/Calif. Residents add 6.5% Sales Tax. Phone Orders Accepted on VISA or MC ONLY. NO C.O.D.'s. Prices subject to change without notice.

STORE HOURS
MON-FRI—10-7
SAT—10-6

*Apple and Apple II are the trademark of APPLE COMPUTERS, INC.

CIRCLE 212 ON READER SERVICE CARD

all your records and make the change only to Neverburger's record:

```
. replace street with ''33rd & 3rd
  Street'' for last:name=''NEVERBURGER''
  <CR>
00001 REPLACEMENT(S)
```

dBASE II will take a little longer on this command than on the last one because it will search the entire database instead of stopping at the first occurrence of NEVERBURGER. Also, beware that this command will modify the street address of all Neverburgers in your database, not just the first one. This is an

Erroneous and outdated records can slow down locating and other processes. They can also lead to other types of data contamination.

example of the type of command that can wreak havoc on your database if you aren't careful. On the other hand, it exemplifies dBASE II's ability to eliminate drudgery through ''automatic'' editing.

As another example of using the Replace command for automatic editing, let's say several of your business associates work for the same company. If the company were to change its phone number for some reason, you would have an easier time using the Replace command to update the phone numbers than changing each record individually. The command line would look something like this:

```
. replace work:phone with ''415-555-1212''
  for company=''THE PRINTER WORKS'' <CR>
  00005 REPLACEMENT(S)
```

Eliminating Unwanted Records

Keeping your database clean and uncluttered is central to optimizing dBASE II's efficiency. Duplicate, incomplete, erroneous, and outdated records can slow down locating and other processes. They can also lead to other types of data contamination and potentially embarrassing situations such as invoices and phone calls going to the wrong people. So, it is good practice to purge your database of unwanted records regularly.

What's the procedure? You may have noticed that the list of control codes in the Edit section includes one for deleting records (^U).

By pressing ^U when you are editing a record and then saving the changes by typing ^W, you tell dBASE II to mark the record for *later* deletion. If you tried this, you probably noticed that a little sign (DELETED) appeared on the top line of your monitor. Pressing the ^U once again removed the sign. This on-and-off action is called a ''toggle'' because it is like a light switch. All the Delete command really does is insert an asterisk between the record number and the first field. It doesn't actually erase the record from the database, to prevent accidental catastrophes. (Another step, the Pack command is necessary before dBASE II will eliminate the record for good—more about this later.)

GAME BOOKS
FROM *CREATIVE COMPUTING*

BASIC COMPUTER GAMES, Microcomputer Edition, edited by David H. Ahl. Here's a great collection of 101 fascinating games, all written in easy-to-use Microsoft BASIC. Play Craps, Combat, Super Star Trek, Lunar LEM Rocket, Gomoko, Checkers, Boxing, Bowling–and 93 others! With an introduction, notes on Microsoft BASIC, and conversion instructions for other BASICs. 8¼" x 11", softcover illustrated, with an index, 183 pp. $7.95 ($1.50). **#6C**

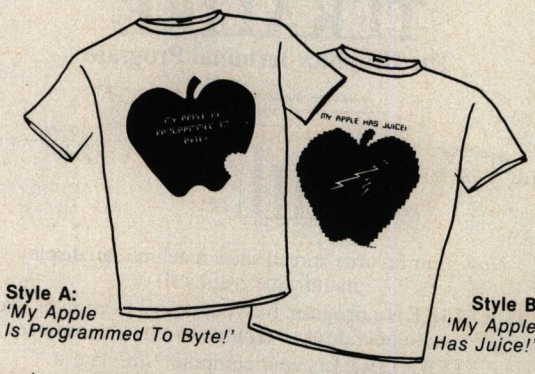
MORE BASIC COMPUTER GAMES, edited by David H. Ahl and Steve North. In this sequel to *Basic Computer Games* you'll find 84 challenging new games, complete with sample runs, program listings and illustrations. All run in Microsoft BASIC. Race your Ferrari, become a millionaire, joust with a knight, crack a safe, and more! Conversion table to other BASICs included. 8¼" x 11", softcover, illustrated, 200 pp. $7.95 ($1.50) **#6C2**
TRS-80 Microcomputer Edition, $7.95 ($1.50). **#6C4**
TRS-80 is a registered trademark of the Radio Shack Division of Tandy Corp.

CREATIVE COMPUTING PRESS Dept. NC8Q, 39 E. Hanover Ave. Morris Plains, NJ 07950
Send me the books listed below:

ITEM NO.	QTY.	TITLE	PRICE EACH	P&H* ( )	TOTAL
			CA, NJ and NY residents add applicable sales tax		
Outside USA add $3 to regular postage and handling per order.				TOTAL AMOUNT	

CHECK ONE: PAYMENT ENCLOSED $_____
☐ CHARGE MY: ☐ American Express ☐ MasterCard ☐ Visa
(Charge and phone orders: $10 minimum.)
Card No._____ Exp. Date_____
Mr./Mrs./Ms._____
(please print full name)
Address_____ Apt._____
City_____ State_____ Zip_____
For faster service **CALL TOLL FREE: 800-631-8112.** (In NJ call 201-540-0445)

APPLE TEES!



Style A: *'My Apple Is Programmed To Byte!'*
Style B *'My Apple Has Juice!'*

Stand up and be counted with these great 50% cotton — 50% polyester T-shirts, light blue with red lettering. Adult & child sizes. A great gift for that Apple-lover in your life!

Apple is a registered trademark of Apple Computers, Inc.

Make check payable to:
SINEQUANON
P.O. Box 235
Cedarhurst, N.Y. 11516

Please rush me _____ shirt(s) at $8.50 each (shipping included). Circle style and size below:
Style: **A** or **B**
Adult: **S** **M** **L** **XL**
Child: **S** **M** **L**

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
(Allow 4 to 6 weeks delivery)

CIRCLE 198 ON READER SERVICE CARD

Other Deletion Techniques

You can use the Delete command, like Edit, in several ways—in fact, this is the case for most dBASE II commands,

You can use the Delete command, like Edit, in several ways—in fact, this is the case for most dBASE II commands.

with identical rules in most instances. Here are a few examples of ways, besides using ^U, you might mark a record for deletion. Let's eliminate Adriator Bedwax for the simple reason that his (her?) name is just too preposterous.

```
. locate for last:name=''BEDWAX''<CR>
RECORD 127
. delete <CR>
00001 DELETION(S)
```

Or, more simply . . .

```
. delete record 127
```

Or, instead of the last two commands . . .

```
. delete for last:name=''BEDWAX'' <CR>
00001 DELETION(S)
```

Any of these methods would work. Now, just for your future reference, here are several other ways you could use the Delete command. (Refer to last issue's section on the pointer if you're in doubt about these.)

```
. delete all <CR>
. delete next 10
. delete next 10 for company=''ABC GUM''
. delete for first:name=''VALERIE''.and
  .last:name=''KULETZ''
```

Don't let that last one throw you. It just tells dBASE II to look at two fields instead of one before deleting the record. Using this type of syntax, you could have dBASEII delete JOHN SMITH while leaving BILL SMITH alone.

Who's Deleted Already?

After trying all these commands, you have probably marked lots of records for deletion. Just to find out who's marked for deletion, type

```
. display for * <CR>
```

or, for a less cluttered screen . . .

```
. display first:name, last:name for * <CR>
```

Oops! or Undeleting Records

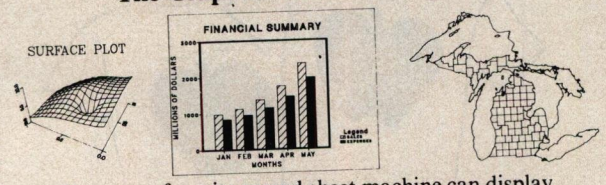
Now, what if you decide that you want to hang on to those records after all? No problem. You can "undelete" them with the Recall command. It works exactly like Delete, except in reverse. To save all your deleted records, just type

```
. recall all <CR>
```


★★★ New and Improved ★★★

TEKALIKE

The Graphics Terminal Program



Now your favorite spread sheet machine can display mainframe graphics!

TEKALIKE is a program for your Apple Computer that allows it to operate as a terminal to a host computer.

TEKALIKE lets your computer 'simulate' a Tektronix 4010 graphics terminal for both graphic input and output.

Now your Apple can take advantage of software that was written to operate with the Tektronix 401X family of terminals.

TEKALIKE also allows hard copy plots to be drawn from your 'local copy' of Tektronix output, completely off-line from the host computer system!

TEKALIKE requires an Apple *IIe* or 48K II+ personal computer, one disk drive, and a modem for connection to a host computer. **TEKALIKE** is supplied with an intuitive users manual.

Price $200 Plus $12 tax (CA)
Manual Only $25

MasterCard and VISA Accepted
To Order Call (916) 893-1162
Dealer Inquiries Welcome

Contact us for more complete information.

WE Software
800 Greenwich Drive
Chico, CA 95926

Apple is a trademark of Apple Computer Inc.
Tektronix is a trademark of Tektronix Inc.

CIRCLE 154 ON READER SERVICE CARD

FREE CATALOG

Over 275 Software & Hardware Products for your

APPLE II / IIe®

CALL TOLL FREE **800-327-2251**

IN FLA. 305-261-8737

FACT: Low, Low Prices!

VISA MasterCard AMERICAN EXPRESS

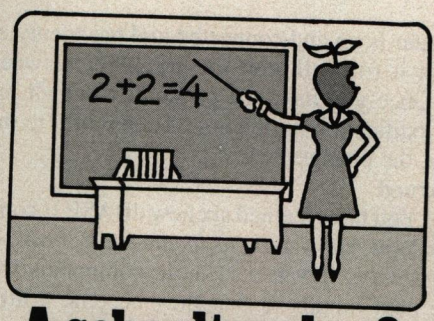
	1-4 Bxs	5 + Bxs
Verbatim 5-1/4", SS/DD MD 525-01, Plastic Box	24.95	23.95
Dysan 5-1/4", SS/DD 104/ID, Hard Box	36.95	35.95

ALMALY TRADING CORPORATION
COMPUTER PRODUCTS DIVISION
7801 Coral Way, Suite 116
Miami, FL 33155 Telex: 51-9602

TERMS: MO, Cashier's Check, Personal Check (allow 10 days), School P.O. Accepted, C.O.D. (add $1.65). VISA/MC/AMERICAN EXPRESS add 3%, Shipping and Handling: 1-4 bxs. $2.75, 5 or more bxs. *0.65/bx. FLA add 5% sales tax. Retail prices may vary. References Dun & Bradstreet.

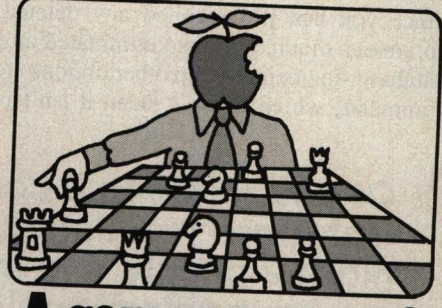
CIRCLE 203 ON READER SERVICE CARD

How can you turn your Apple into



A schoolteacher?

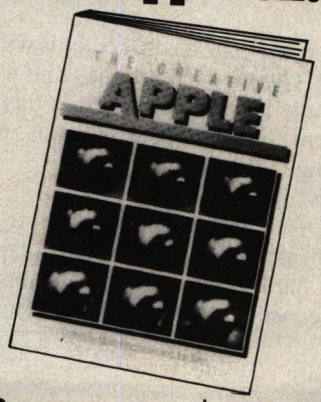
An accountant?



A game opponent?

A security guard?

A secretary?



Let The Creative Apple show you how–for only $16.95!

Your Apple computer is one of the most versatile instruments ever invented ...if you know its potential and how to tap it. Now there's a new book that brings you the most useful, most innovative applications for your computer—and tells you how to run them on your Apple!

The book is *The Creative Apple*, from *Creative Computing*. In ten chapters and hundreds of pages, *The Creative Apple* gives you the important Apple-oriented articles from the past several years of *Creative Computing*, along with vital updates.

You'll discover how to use your Apple for graphics, including animation, kaleidoscope effects, hi-resolution text, the Apple Picture Packer, the Apple Graphics Tablet, and integrating CAI and videotape.

You'll learn how to play music on your computer (and you'll appreciate the reviews of synthesizer peripherals)...how to use computers in the classroom for teaching (as well as for computerizing your gradebook)...using the Apple Writer software...understanding word processing by computer...solving the lower case mysteries...three programs for investors ...VisiCalc...computer-generated forms ...VisiPlot, VisiTrend and other software for business uses.

The Creative Apple includes software reviews of games, business programs—even a flight simulator program...hardware reviews of peripherals for your Apple...14 ready-to-run game programs ...tips and tricks for easier programming (including how to bombproof data entry).

You'll also find three years' worth of the popular "Applecart" column from *Creative Computing*, a guide to data banks, instructions on using your Apple for a time-sharing terminal, as a home appliance controller (and burglar alarm), and scores of programming tips.

The Creative Apple is an important reference. If you own an Apple computer, it's vital that you read it. You'll be amazed at how much time, trouble and money *The Creative Apple* will save you.

To get your copy of this great new book, just complete and return the coupon below!

Also available at your local bookstore or computer store.

CREATIVE COMPUTING PRESS Dept. NK7F, 39 East Hanover Avenue Morris Plains, NJ 07950

YES! Please send me *The Creative Apple* for $16.95 plus $2 postage and handling. (Outside U.S.A., add $3 additional postage.

☐ **Payment enlcosed $** _____. (CA, NJ and NY State residents add applicable sales tax.)

Card No._____ Exp. Date_____

Signature_____

Mr./Mrs./Ms._____
(please print full name)

Address_____ Apt._____

City/State/Zip_____

Apple is a registered trademark of Apple Computer Inc.

For faster service, PHONE TOLL FREE 800-631-8112.
(In NJ only, 201-540-0445.)

Packing Your Database

The process of actually eliminating unwanted records from your database is called "Packing." Please try it now by typing

```
.pack <CR>
00100 RECORDS COPIED
PACK COMPLETE, 00163 RECORDS COPIED
```

Since you had just recalled any deleted records, the Pack command should not have eliminated any records from your database. Incidentally, no other options are available with this command, which doesn't mean it isn't powerful. One false move and your deleted records will vanish. Once you issue the Pack command, you'll have no way of recalling your deleted records. The program erases them and moves the remaining records up to fill the gaps. Thus, your old record numbers will change also.

Of course, when it comes to database maintenance, the highest priority is to make regular backup copies.

Grist for the Mill

Of course, when it comes to database maintenance, the highest priority is to make regular backup copies. Both floppy and hard disks are fragile media for storing what are sometimes valuable databases. It's better to have a somewhat littered database than none at all, so if you're short on time, just use PIP to make a backup on another disk.

A good technique for determining whether your database needs housecleaning is to print it out on paper and examine it manually. You can do this with the List command, followed by the "to print" clause:

```
. list (fields of your choice) to print <CR>
```

Make sure your printer is on and connected and has plenty of continuous paper in it (or will stop the computer between individual pages). Once you have the printout, mark all the records that need modification or deletion. Then return to the computer and make the changes.

What You've Learned

Congratulations! You have learned six new dBASE II commands. You should now know how *to locate, edit, browse, replace, delete,* and *pack*. Try to use these commands frequently during the next month so that they become a little more automatic. If you get stuck, try typing

```
.help (command name) <CR>
```

The dBASE II Help function may be of assistance. If you get a syntax error, refer to the last issue of *A+*, which addressed that subject. And of course, if all else fails, try to read the manual.

In the next installation of the *A+* dBASE II tutorial, we will discuss faster techniques for data retrieval—indexing and sorting. ✚

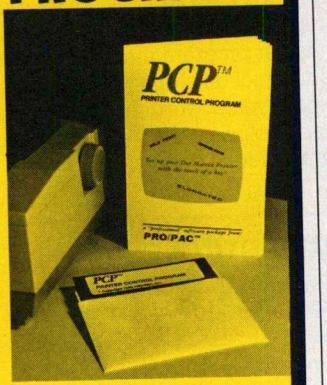
dBASE II is a trademark of Ashton-Tate.

Set Up Your DOT MATRIX PRINTER With a Touch of a KEY!

PCP™ PRINTER CONTROL PROGRAM

- BOLD PRINT
- COMPRESSED PRINT
- VARIABLE LINES
- ELONGATED PRINT
- AND MUCH MORE!

No longer do you have to enter long "set up strings" to take advantage of your DOT MATRIX PRINTER's capabilities. Just select from the MENU...let your computer do the rest! Comes complete with PROGRAM DISKETTE and an OPERATING MANUAL. Easy to use.



VERSIONS:
Apple II+, Apple //e and Apple /// with
APPLE DOT MATRIX
EPSON RX, MX*AND FX SERIES
C.ITOH PROWRITER I&II
& NEC DOT MATRIX PRINTERS

Please Specify Computer and Printer

a "professional" software package from:

PRO/PAC™
14925-A Memorial Drive, Suite 207
Houston, Texas 77079
(713) 496-1179
* Requires Graftrax Plus™ For Full Features

See Your Dealer or Write or Call Us!

NOW ONLY $29.95

plus $2.00 shipping and handling USA
VISA and MasterCard Credit Cards

PRO/PAC™ is a trademark of PRO PAC, INC.
PCP™ is a trademark of PRO PAC, INC.
APPLE® is a registered trademark of Apple Computer, Inc.

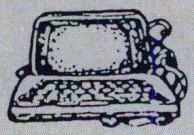
CIRCLE 164 ON READER SERVICE CARD

Micro Co-op

the microcomputer software co-operative

Over 4 thousand Apple owners already belong to the largest software co-operative in the world. In Micro Co-op's bi-monthly newsletter our experts review and compare the latest software packages available for the Apple, keeping you up to date on the newest developments in applications, simulations, utilities, education, and gaming. The co-op has also just installed a toll-free ordering number for members.

To join Micro Co-op, we charge only a $5 membership fee; we support our services primarily through the software that members buy through the co-op. Our goal is to get you the information you need to make software decisions you won't regret.



610 E. Brook Drive
Arlington Heights, IL 60005

(312) 228-5115

prices Currently 15% to 25% below retail

CIRCLE 199 ON READER SERVICE CARD

WRITE YOUR OWN APPLE GAMES

Includes 40 exciting pre-programmed games to get you started!

Write Your Own Apple Games is your ticket to thousands of hours of solid game fun.

But it's more than just a game book.

While you're enjoying more than 40 exciting new programs, you'll be learning—quickly and easily—the most advanced techniques of computer game design.

In ***Write Your Own Apple Games,*** Stuart Anstis explains each game to you in logical, step-by-step subroutines. You'll see crucial game graphics exactly as they should appear on your screen.

Then you'll learn how to rearrange the basic subroutines to create countless game variations.

If you know BASIC, you're ready to learn state-of-the-art game techniques, including how to:

- Create smooth, flicker-free screen movement
- Generate flashing "neon-sign" graphics
- Keep game scores
- Use random number in game design—and make your computer come alive as an opponent
- Zero in on random time delays—a challenge to even the most sophisticated arcade player

And much more.

Write Your Own Apple Games gives you all the skills you need to start designing your own original computer games for fun—and profit!

And because writing your own games gives you greater control of your Apple's numerical and graphic capabilities, you'll be opening the door to fantastic new possibilities for using your computer.

Write Your Own Apple Games should sell for over $1,000—the cost of 40 prepackaged games.

Action Games
Tank • Sprint • Bomber
Wait For It • Painting
Race • Weight Lifters
Target • Helicopter
Tiddler • Pingpong
Diddle • Space Zapper
Craps • Cross Porpoises

Strategy Games
Zigzag • Bridge-It • Stock Market • Gold Auction
Tictactoe • Turnover
Chomp

Word Games
Hangman • What's My Word? • Birthdaywish
What's Your Name?
Any Messages?

Graphics Subroutines
Butterfly • Firework
Electric Field • Stopwatch
Lissajou

Solo Games and Puzzles
Simon • Organ • Elithorn
Running On Empty
Guess A Number
Buried Treasure
Jumpers • Peggy

Educational and Scientific Games
Arrow • Random Walk
Scatter • Curve
Magic Squares

But you can get ***Write Your Own Apple Games*** for only $12.95. That's less than 32 cents a game—and every game you write yourself is virtually free!

Start having some serious fun with your Apple computer. Send for your copy of ***Write Your Own Apple Games*** today.

Also available in your local bookstore or computer store.

MAIL TODAY TO:
CREATIVE COMPUTING PRESS
Dept. NK3F , 39 East Hanover Avenue
Morris Plains, N.J. 07950

Please send me ____ copies of ***Write Your Own Apple Games*** for only $12.95 each, plus $2.00 shipping & handling per book. #2W.

Total amount $_____

☐ **Payment Enclosed.** (CA, NJ and NY State residents please add applicable sales tax).

☐ **CHARGE MY:**
☐ American Express
☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Signature_____

Name_____ (please print)

Address_____

City_____

State_____ Zip_____

*Outside the U.S.A. add $3 for shipping and handling.

☐ Check here to receive FREE catalog of computing books, magazines and guides.

For faster service,
PHONE TOLL FREE
800-631-8112
(In NJ only: 201-540-0445)

IBM

Hayes Smartmodem 1200B w/Smartcom II™ Software

SPECIAL PRICE $399.95

★ NEW FROM HAYES ★

MICROMODEM //e

$259.95

SUPPORTS II+, //e, APPLE III
INCLUDES
SMARTCOM I SOFTWARE AND
FREE SOURCE SUBSCRIPTION

★ PROMETHEUS ★

PRO-MODEM 1200

INCLUDES PRO-COM SOFTWARE, CLOCK, CALENDAR AND IS HAYES COMPATIBLE

IT'S ABOUT TIME !! $399

HARDWARE

ALS CP/M CARD w/64K MEM	299.95
AMDEK 300 AMBER	149.95
AMDEK COLOR I	299.95
BROTHER (DYNAX) DX15	449.95
EPSON FX 80	519.95
EPSON MX 100	639.95
FINGER PRINT (EPSON)	46.95
GEMINI 10X 120 CPS	269.95
GIBSON LITE PEN	239.95
GRAPPLER+ INTERFACE	119.95
GRAPPLER+ w/16K ON-BOARD BUFFER (TO 64K)	169.95
HAYES 1200 BD SMART MODEM	469.95
★ HAYDEN SOFTWARE ★	
HOW TO PROGRAM APPLESOFT BASIC	39.95
INSTANT RECALL	49.95
DOLLARS & CENTS	79.95
MULTIPLAN C-64	89.95
TEAC ½ HGT. APPLE DRIVE	249.95
FLIP 'N FILE 25	21.94
MAXELL/VERBATIM (SSDD)	22.95
DANA SUPER FAN WITH SURGE SUPPRESSOR	39.95
KOALA PADS	79.95
MICROSOFT 16K RAMCARD	67.95
MICROSOFT SOFTCARD	219.95
MICROSOFT PREMIUM PAK	459.95
MICROSOFT //e SOFTCARD CP/M 80 COL & 64K (1 CARD)	359.95
NEC 12" COLOR	289.95
NEC 12" GREEN	99.95
NEC 8023 PRINTER	379.95
NOVATION APPLE CAT II	249.95
NOVATION EXP MODULE	36.95
NOVATION HAND SET	26.95
NOVATION TOUCHTONE	85.95
OKIDATA 92P	439.95
OKIDATA 93P	729.95
PROWRITER 8510	349.95
RANA ELITE I	239.95
RANA ELITE II	379.95
RANA ELITE III	479.95
SATURN SYSTEM 128K	399.95
SSM 1200 BD MODEM	499.95
SYSTEM SAVER FAN	64.95
T.G. JOYSTICK	42.95
T.G. SELECT-A-PORT	42.95
TAXAN 12" AMBER	139.95
TAXAN 12" COLOR RGB	329.95
USI 12" HI RES AMBER	149.95
USI 12" HI RES GREEN	144.95
VIDEX 80 COL CARD w/SOFTSWITCH	169.95
VIDEX ENHANCER (7)	109.95
VIDEX FUNCTION STRIP	39.95
WIZARD 16K PARALLEL BUFFER INTERFACE 2 YR WNTY.	139.95
WIZARD IPI PARALLEL INTERFACE	62.50
ZENITH 12" GREEN	99.95

IBM QUADLINK	595.00
IBM LOTUS 123	299.95
IBM THE ACCOUNTANT	159.95

GARDEN OF EDEN

COMPUTERS

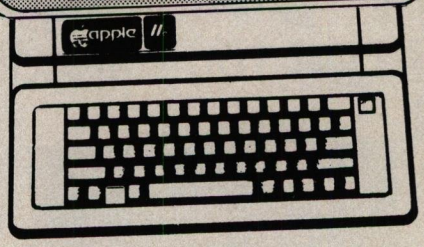
16485 Magnolia
Westminster, CA 92683
½ blk. N. of the 405 Frwy.

CREDIT CARD ORDERS ONLY
(FROM OUTSIDE CALIF.)

800-762-3227

PLEASE HAVE CREDIT CARD READY
ALL OTHER ORDERS & INFO. CALL

714-841-4994



★ **NEW** ★

Star Micronics Delta-10 dot matrix printer.

8K BUFFER SERIAL & PARALLEL 80-136 COL
160 crisp characters every second w/100% duty cycle.
DOES EVERYTHING THE EPSON FX80 DOES & MORE FOR JUST $499.95

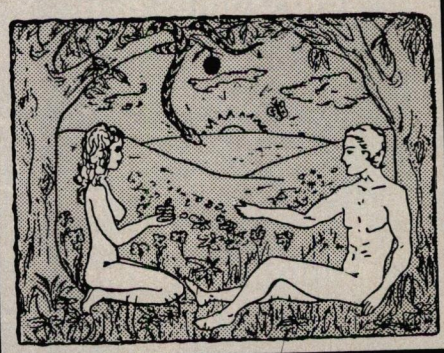
Hayes Smartmodem
1200 BD RS232 **$469.00**

Rana Systems

Elite One	$239.95
Elite Two	$379.00
Rana Three	$479.00
Rana Controller	$ 75.00

COMMUNICATIONS PAK SALE

Hayes Smartmodem 1200 BD RS232	$469.00
Source Subscription	$49.95
ASCII Express Pro	$ 89.95
ALL THREE PIECES	$599.95



SOFTWARE

ALGEBRA I, II, III, IV EACH	29.95
ACSII EXPRESS	44.95
BANK STREET WRITER	46.95
BEAGLE APPLE MECH	19.95
BEAGLE BAG	19.95
BEAGLE BASIC	24.95
BEAGLE DOS BOSS	17.95
BEAGLE DOUBLE TAKE	24.95
BEAGLE FLEX TEXT	19.95
BEAGLE PRONTO DOS	19.95
BEAGLE TIP DISK #1	14.95
BEAGLE TYPEFACES	14.95
BEAGLE UTILITY CITY	19.95
CHOPLIFTER	25.95
D BASE II	415.95
DB MASTER IV NEW	239.95
DB UTILITY PAK	89.95
DEADLINE	33.95
FINANCIAL PARTNER	169.95
FIRST CLASS MAIL	69.95
FORMAT II ENHANCED	109.95
HOME ACCOUNTANT	49.95
KIDS AND APPLES	14.95
KNOW YOUR APPLE //e	21.95
LETTER PERFECT	99.95
MAGIC CALC	99.95
MAGIC MAILER	47.95
MAGIC WINDOW	69.95
MAGIC WINDOW II	99.95
MICROPRO WORDSTAR	299.95
MILLIONAIRE	49.95
MINER 2049	29.95
MULTIPLAN DOS OR CP/M	174.95
PFS FILE //e OR II+	79.95
PFS GRAPH //e OR II+	79.95
PFS WRITER //e	79.95
PFS REPORT //e OR II+	79.95
PIE WRITER	109.95
PINBALL CONST SET	28.95
SARGON II	24.95
SENSIBLE SPELLER	79.95
SPELLING BEE GAMES	29.95
SUPERTEXT II	74.95
"THE WORD" BIBLE PROCESSOR	139.95
TYPING TUTOR II	19.95
ULTIMA III	39.95
VISICALC //e 128K	239.95
VISITREND/VISIPLOT	219.95
WIZARDRY	36.95
WORD HANDLER (SPECIAL)	49.95
ZAXXON	29.95
ZORK I, II, III	EACH 26.95

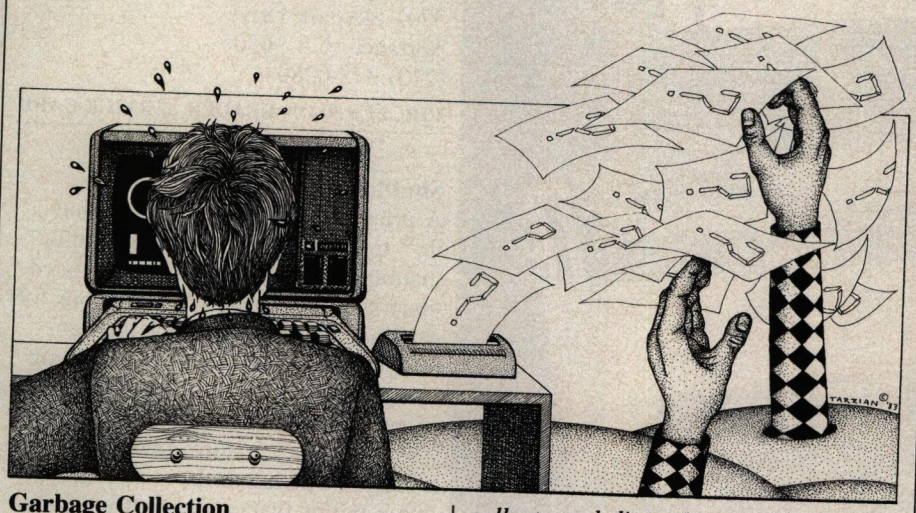
BECAUSE HARDWARE AND SOFTWARE PRICES ARE CHANGING SO RAPIDLY, WE URGE YOU TO CALL US FOR OUR VERY LOWEST CURRENT PRICES!

WE APPRECIATE YOUR BUSINESS and will do everything we can to make you happy.
TERMS: F.O.B. Westminster, CA. We accept VISA, Mastercard, Cash, Checks, Certified Checks are better. Money Orders and Purchase Orders (2% 10-Net 15). Add 2% for bank cards & P.O.'s. Most orders are shipped today or tomorrow via UPS insured. Prices are subject to change and hopefully will go down ! Unless otherwise noted, all prices are Apple.

Apple is a registered trademark of Apple Computer.
EPSON is a registered trademark of EPSON America.

RESCUE SQUAD/BY LINDSAY McGRATH

How to keep the Apple II Plus from stopping in the middle of a program, and how to print Business Graphics



Garbage Collection

Q: Here's a mystery for you. Sometimes, unpredictably, my Apple II Plus stops in the middle of a program it's running, pauses for several minutes, and then starts up again. I used to be afraid I'd lose my program during these lapses, but once the computer starts running the program again, everything is fine. What causes these pauses? Is there something wrong with my computer?

A: *There is nothing wrong with your computer. What you're witnessing is called garbage collection. It's Applesoft's way of throwing out old data filling up its free memory. There is no way to prevent or predict these pauses, but you can expect garbage collections periodically when you handle a lot of data or work with restricted memory on your Apple.*

Applesoft interrupts your program to throw out old, unused string-variable values that are filling up its available memory. Every time Applesoft changes the value of a string variable in a program, it stores the new value in memory but does not erase the old value. If there are enough variables in the program, all the free memory is soon full of old unused strings.

That's when Applesoft steps in and performs its garbage collection. It sorts through all the strings in memory, and collects and discards any unused ones. The more string variables, the longer Applesoft's sorting and tossing will take.

If you are a programmer, there is a way you can incorporate garbage collection into your software. Applesoft collects garbage when it encounters the FRE(Ø) command. Here is a sample line you can use to initiate garbage collection if it's necessary: 1000 IF PEEK (112)-PEEK (110) < 2 THEN PRINT "BE PATIENT": A=FRE (Ø)

There is a way you can incorporate garbage collection into your software.

This line tells Applesoft to check the value of PEEK (112)-(PEEK 110) and, if it finds that value is less than two, to print the message "PLEASE BE PATIENT" and execute a FRE (Ø) command. Execution of the FRE (Ø) command causes garbage collection to occur.

***Business Graphics* on the C. Itoh**

Q: How do I print *Business Graphics* to my C.Itoh printer?

A: Business Graphics *for the Apple III and Apple II and IIe can be printed to a variety of printers. This is made possible by having your authorized Apple dealer install the proper printer interface on the* Business Graphics *disk. The Printer Interface Kit (PIK) is made by Business & Professional Software in Cambridge, Massachusetts, and can be obtained through your Apple dealer. The package comes with software for many printers, and the Apple dealer will install only the one you need. It is not necessary to purchase the entire PIK. Printers and plotters supported are listed below.*

Anadex DP9001(A), DP9501(A)
Apple dot-matrix printer, daisy-wheel printer, Silentype printer, plotter
Centronics 122, 352, 353
C.Itoh Prowriter 1550, 8510A
Diablo 630, 1610, 1620, 1630, 1640, 1641, 1650
Epson MX-80, MX-80 W/GRAFTRAX, MX-80 F/T, MX-80 F/T W/GRAFTRAX, MX-100
Houston Instruments (HIPLOT) DMP3, DMP4, DMP6, DMP7
Hewlett-Packard plotters HP-7220, HP-7221, HP-7225, HP-7470
IDS Prism, Paper Tiger 440G, 445G, 460G, 560G
NEC Spinwriter 3510, 3550
Okidata 82A, 83A, 84
Qume Sprint 5/45, 5/55
Strobe plotter model 100
Watanabe plotters WX4633, WX4634, WX4635, WX4636, WX4637, WX4638, WX4671, WX4675
Xerox printers 1710, 1720, 1730, 1740, 1741, 1750 ✚

Please send your questions and problems to Rescue Squad, A+, 1 Davis Drive, Belmont, CA 94002.

PRODUCT NEWS

The ComRiter CR-II daisy-wheel printer

HARDWARE

ComRiter CR-II

The ComRiter CR-II is a new daisy-wheel printer with low-cost accessories. This complete letter-quality printing system can perform as either a word processor with most personal computers or as a stand-alone electronic typewriter with two-color printing ability.

The new accessories are a lightweight keyboard and a cut-sheet feeder. The keyboard can convert the CR-II into an electronic typewriter, and the cut-sheet feeder provides automatic paper-handling features previously found only in more expensive word-processing systems. A tractor-feed accessory rounds out the system.

The CR-II, which runs at 12 characters per second, is compatible with most microcomputers and word processors. The printer's features include superscript, subscript, backspace, underline, boldface, double strike, and proportional spacing. The CR-II also has a 5K buffer that allows users to reproduce original and multiple copies of documents stored in its memory. The buffer can store up to three pages of data.

The ComRiter CR-II measures 19.3 inches wide, 6 inches high, and 13.1 inches deep. The CR-II lightweight keyboard can be used on a desktop or on a lap. The keyboard has alternate shift keys and an adjustable stand. It features 46 keys, 96 characters, and a 48-character buffer memory. The feeder, which has an adjustable paper hopper, has a capacity of 250 sheets. *(List Price: $599)*

Requires: Apple II, II Plus, or IIe.

Comrex International, Inc.
3701 Skypark Drive
Torrance, CA 90505
(213) 373-0280

CIRCLE 550 ON READER SERVICE CARD

ShuffleBuffer

A printing buffer designed to "shuffle" text, graphics, spreadsheet information, and other computer-generated materials into various combinations for printing, plotting, or telephone transmission. Applications include mailing lists, letter mergings, and preparation of personalized form letters.

The product features two additional modes of operation: the standard, dumb-buffer function of first-in, first-out (FIFO) printing of material that does not need rearranging or reprinting; and Bypass, the interruption of a long printout in order to produce a separate document on an immediate basis.

Shufflebuffer is an enhanced version of Interactive Structures' Pipeline random-access printer. The ShuffleBuffer features front-panel controls to permit stacking and is slim enough to fit underneath a disk-drive unit.

The printing buffer is available in 8K increments. (*List Price:* 8K, *$260;* 16K, *$273;* 32K, *$299;* 64K, *$349;* 128K, *$445*. *Other pricing to be announced.*)

Requires: Apple II, II Plus, IIe, or III; printer.

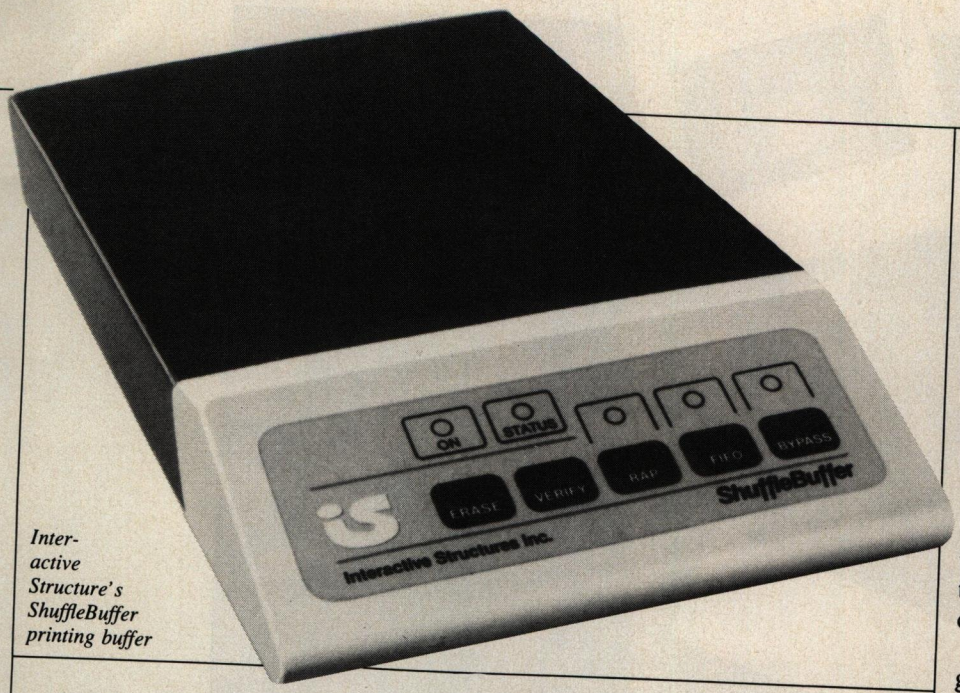
Interactive Structures, Inc.
146 Montgomery Avenue
Bala Cynwyd, PA 19004
(215) 667-1713

CIRCLE 551 ON READER SERVICE CARD

Micro-Sci A82

A disk drive that combines large storage capacity with the ability to read 35-track software.

The A82 is an 80-track, 328K 5¼-inch floppy-disk drive that offers a 5-millisecond access speed. It will boot



Interactive Structure's ShuffleBuffer printing buffer

and read most 35-track diskettes, including half-track protected software, with no modifications.

The disk drive plugs into any existing Micro-Sci C2 or Apple Disk II controller card. With each drive, Micro-Sci supplies a utility software diskette containing programs that modify DOS 3.3, Microsoft CP/M (2.23 and 2.20B), and Pascal 1.1. (*List Price: $569*)

Requires: Apple II or IIe.

Micro-Sci
2158 South Hathaway Street
Santa Ana, CA 92705
(714) 662-2801

CIRCLE 552 ON READER SERVICE CARD

HARDWARE/SOFTWARE

Soundmaster II

Soundmaster II is a product that gives Apple II, II Plus, and IIe arcade-level stereo sound capabilities. The Soundmaster II package includes a Soundmaster II card, an instruction manual, and a demonstration disk containing sample sounds and preprogrammed output routines. You can program Soundmaster II in BASIC or assembly language to produce a variety of sound effects. The demonstration disk contains helper programs to make Soundmaster II easy to program, even for novices.

Soundmaster's two audio amplifiers can directly drive two inexpensive 8-ohm speakers, and RCA plugs allow direct connection to hi-fi systems for louder sound effects.

Each Soundmaster II board contains two sound-generating circuits that provide a total of six tone generators, two noise generators, six mixers, amplitude controls, two envelope generators, and six D to A converters. *(List Price: $119.95)*

Requires: Apple II, II Plus, or IIe.

Kearsarge Industries, Inc.
12310 Pinecrest Road
Reston, VA 22091
(703) 620-5760

CIRCLE 553 ON READER SERVICE CARD

Savvy One and Savvy Pro

Two new versions of the Savvy programming language designed to offer users a high-level programming language integrated with the Savvy operating system and database-management system.

Savvy One includes the Savvy programming language, a database-management system, a text editor, and coprocessor printed circuit card containing a Z80A processor. The software's Draft Database feature enables users to establish databases for a variety of record-keeping tasks. You can also use Savvy One to teach basic computer procedures and elementary programming techniques to computer novices.

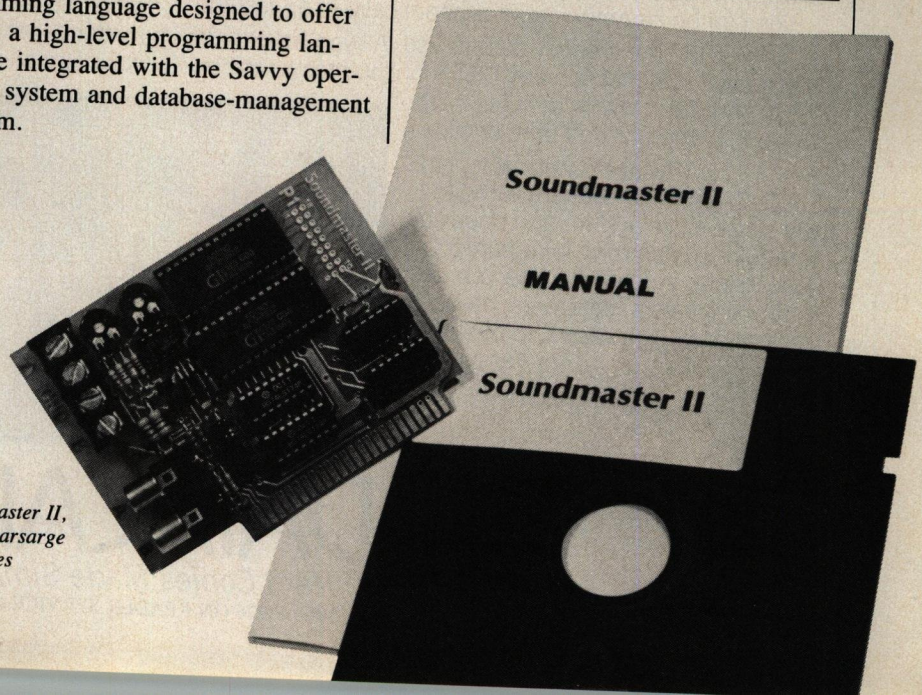
Savvy Pro, designed for multiple- and hard-disk systems, includes an automated database builder, as well as the Savvy programming language, database-management system, and coprocessor.

Both products include Savvy's programming language, which incorporates an adaptive pattern-recognition ability that frees users from memorizing complex commands and highly structured syntax, and substitutes simple descriptions of tasks to be done. Savvy, in all configurations, can run the CP/M operating system and most standard 44K CP/M-based application programs. (*List Price:* Savvy One, *$349;* Savvy Pro, *$495*)

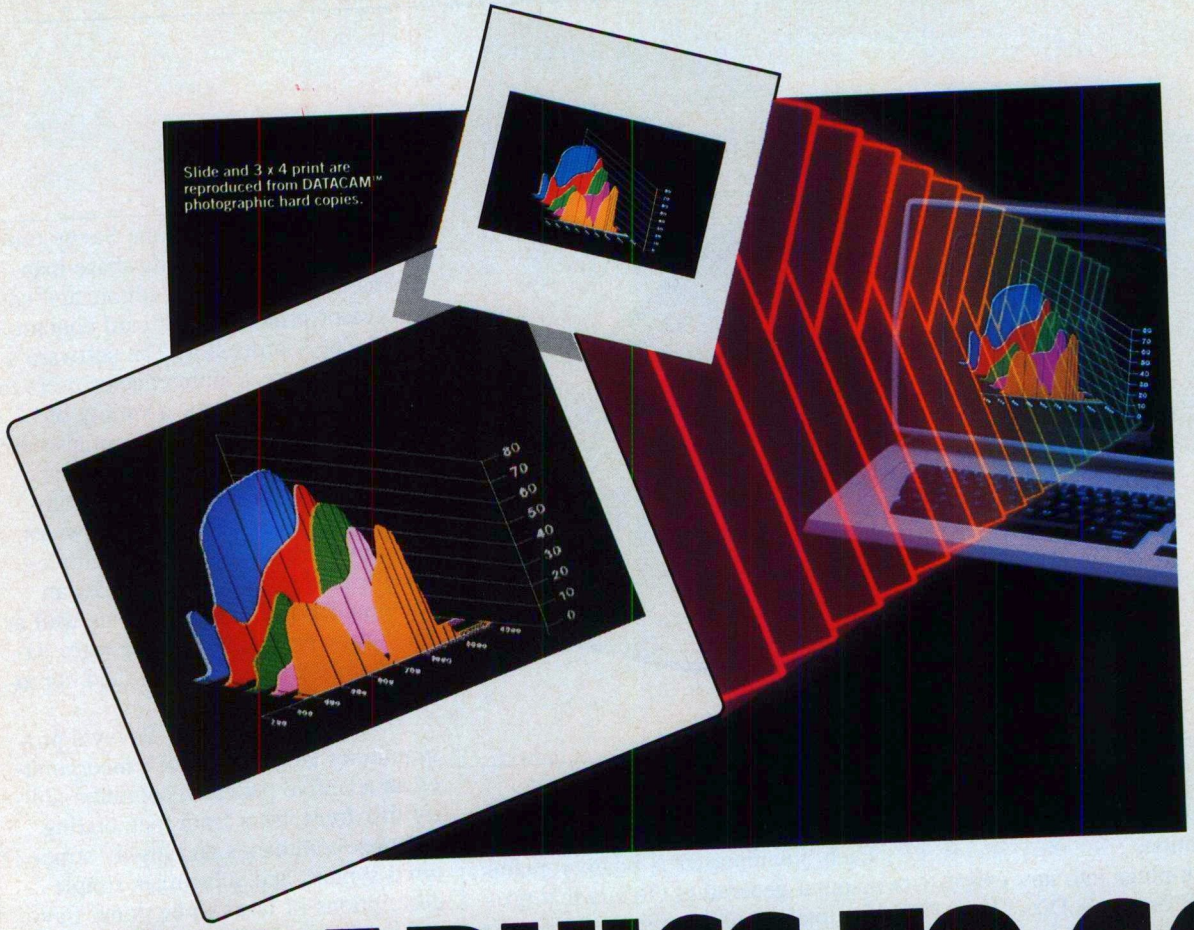
Requires: 48K; Apple II Plus or IIe; Savvy One requires one disk drive; Savvy Pro requires two disk drives.

Excalibur Technologies Corporation
800 Rio Grande Blvd.,
N.W., 21 Mercado
Albuquerque, NM 87104
(505) 242-3333

CIRCLE 554 ON READER SERVICE CARD



Soundmaster II, from Kearsarge Industries



GRAPHICS TO GO

Take Your CRT Graphics To Your Next Meeting. Use DATACAM™ For Instant Color Photos And Slides From CRT Monitors.

Getting your CRT graphics to a meeting shouldn't be time consuming, expensive or difficult to accomplish. DATACAM™ 35 and DATACAM™ I meet the fast rising demand for photographic records of images from CRT monitors for reference and presentations. With a DATACAM™ color recording camera, your display information can be communicated economically, in an instant.

A DATACAM™ is extremely easy to use. All you have to do is place a DATACAM™ on any CRT monitor, press a button to shoot and within minutes have the finished print or slide.

DATACAM™ is portable, too. A DATACAM™ is not hard-wired to a fixed single video system and does not require customizing for a particular video display screen. Anyone can use it from engineers, designers, medical professionals, educators, to business professionals.

DATACAM™ 35 comes in two monitor sizes—12″/13″ and 19″/21″ to fit almost every available screen size. It is perfect for photographically recording CRT graphics in a slide format. When you need an instant audiovisual presentation, your DATACAM™ 35, loaded with Polachrome 35mm film will produce color slides which can be processed on an AutoProcessor and mounted within a matter of minutes. Or, you can use conventional 35mm color film and send it out for developing.

DATACAM™ I is also available in the same sizes as DATACAM™ 35. It is ideal for making instant hard copy 3 x 4 photographic prints for reference data, notebook presentations or file information. DATACAM™ I can be used with Kodak Instant Color Film.

To place your order call toll free **800-962-7370.** In N.Y.S. call **800-828-3030.**

PHOTOGRAPHIC SCIENCES CORP

770 Basket Road
P.O. Box 338
Webster, NY 14580

DATACAM™

Hard Copies Made Simple

CIRCLE 276 ON READER SERVICE CARD

ORDER NOW AND SAVE!

SUBSCRIBE TO A+ AND SAVE UP TO 33%

Enter your subscription to A+, the magazine for your Apple microcomputer, and save up to 33% off our already low subscription price! Every month A+ brings you the latest advances, trends, and information on software, peripherals, applications and new program ideas!

DISCOUNT ORDER CARD

A+ FOR APPLE MICROCOMPUTING

YES, ENTER MY SUBSCRIPTION TO A+ FOR:

☐ One year (12 issues) for only $19.97—**SAVE 20%**
☐ Two years for only $36.97—**SAVE 26%**
☐ Three years for only $49.97—**SAVE 33%**

Savings based on full one-year subscription price of $24.97.

CHECK ONE: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Mr./Mrs./Ms. _____
(print name in full)

Company _____ 4S044

Address _____

City _____ State _____ Zip _____

Add $12 a year in Canada and all other foreign. Please allow 30 to 60 days for delivery of first issue.

SAVE UP TO 33%!

GIVE A GIFT TO A FRIEND AND SAVE!

Now that you will be enjoying month after month of A+, why not share your good fortune (instead of your copy) with a friend! Fill out the attached discount gift card and mail it in today!

DISCOUNT ORDER CARD

A+ FOR APPLE MICROCOMPUTING

YES, ENTER MY SUBSCRIPTION TO A+ FOR:

☐ One year (12 issues) for only $19.97—**SAVE 20%**
☐ Two years for only $36.97—**SAVE 26%**
☐ Three years for only $49.97—**SAVE 33%**

Savings based on full one-year subscription price of $24.97.

CHECK ONE: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Mr./Mrs./Ms. _____
(print name in full)

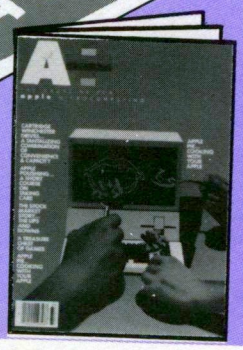
Company _____ 4S044

Address _____

City _____ State _____ Zip _____

Add $12 a year in Canada and all other foreign. Please allow 30 to 60 days for delivery of first issue.

GIVE A GIFT TO A FRIEND!



DISCOUNT GIFT CARD

A+ FOR APPLE MICROCOMPUTING

YES, ENTER A SUBSCRIPTION FOR A FRIEND!

☐ One year (12 issues) for only $19.97—**20% OFF!**
☐ Two years for only $36.97—**26% OFF!**
☐ Three years for only $49.97—**33% OFF!**

Savings based on full one-year subscription price of $24.97.

SEND GIFT TO:

Name _____
Address _____
City _____
State _____ Zip _____

FROM:

Name _____
Address _____ 4S044
City _____
State _____ Zip _____

Gift card to read from: _____

CHECK ONE: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Add $12 a year in Canada and all other foreign. Please allow 30 to 60 days for delivery of first issue.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, CO.

POSTAGE WILL BE PAID BY ADDRESSEE

FOR APPLE MICROCOMPUTING

P.O. Box 2964
Boulder, Colorado 80321

SUBSCRIBE TODAY!

Don't turn your back on the facts...

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

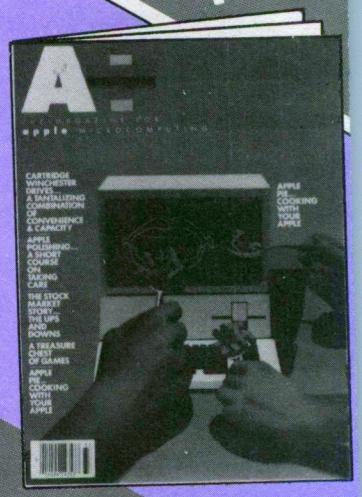
FIRST CLASS PERMIT NO. 66 BOULDER, CO.

POSTAGE WILL BE PAID BY ADDRESSEE

FOR APPLE MICROCOMPUTING

P.O. Box 2964
Boulder, Colorado 80321

SUBSCRIBE TODAY!



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, CO.

POSTAGE WILL BE PAID BY ADDRESSEE

FOR APPLE MICROCOMPUTING

P.O. Box 2964
Boulder, Colorado 80321

SUBSCRIBE TODAY!

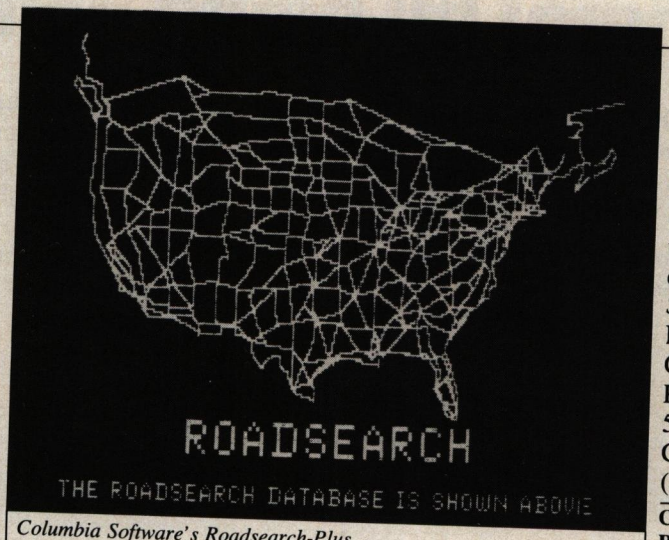
PRODUCT NEWS

SOFTWARE

Roadsearch-Plus

Roadsearch-Plus is a computerized road atlas for the Apple II/IIe personal computer. This program simplifies the process of determining driving routes for anyone who travels over the interstate-highway system by computing different types of routes. The most powerful program determines and prints the shortest practical route between cities in its database. This program can also avoid toll or other roads. Another program develops routes that may be longer, but more suitable to a user's specific needs.

Roadsearch-Plus contains a database of 406 cities and road intersections and about 70,000 miles of interstate and major highways throughout the U.S. and Canada. The program also contains a Roadmap Development System that lets users customize their roadmap with up to 50 additional cities or road junctions and 100 additional road segments anywhere in North America. The user can add local roads, favorite shortcuts, and new destinations, as well as keeping his database current with the latest roadmap revisions.



Columbia Software's Roadsearch-Plus

The printed outputs from Roadsearch-Plus include the driving route, distances, travel times, and fuel usage in different formats. *(List Price: $74.95)*

Requires: Apple or Apple IIe

Columbia Software
P.O. Box 2235A
5461 Marsh Hawk
Columbia, MD 21045
(301) 997-3100

CIRCLE 555 ON READER SERVICE CARD

Queen of Hearts

A video pinball game designed for true pinball addicts. Queen of Hearts features a sequential scoring system just like that in real pinball games, five different flippers to keep the ball in

SCRG PRESENTS

For Your Apple][, Apple][+, Apple //e, Apple /// & Franklin

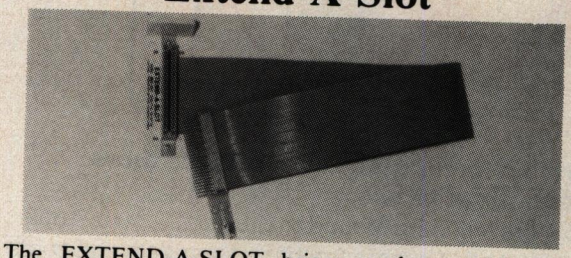
switch-a-slot

The **switch-a-slot** connects to any peripheral slot of the computer through an 18" cable. The user can plug up to four cards in the **switch-a-slot**. The desired card is chosen by using a switch on the front, and only the selected card draws power. This product is suitable for most peripheral cards. The **switch-a-slot** is perfect for selecting between different printer cards.

- **Holds 4 peripheral cards**
- **Saves wear and tear on delicate connectors**
- **All connectors are gold plated for reliability**
- **Only selected card draws power**
- **Works with most cards**

$179.50

Extend-A-Slot



The EXTEND-A-SLOT brings a slot outside your APPLE™, allowing an easy change of cards. The 18" flex cable is long enough to allow placement of the card in a convenient location. The high quality connectors are gold plated for reliability. **$34.95**

These products work well with all slow to medium speed cards, such as Modems, Printers, Clock, Music, etc. They are not recommended for high speed data transfer devices such as alternate processor and disk drive controller cards.

These fine products come with a 6 month warranty
Available at your local dealer or direct from:

SOUTHERN CALIFORNIA RESEARCH GROUP
Post Office Box 2231 - C
Goleta, CA 93118
(805) 685-1931
VISA, MASTERCARD accepted

Add $2.50 for shipping, $5.00 outside U.S.A. & Canada. CA add tax.

Apple is a trademark of Apple Computers. Franklin is a trademark of Franklin Computers.

CIRCLE 198 ON READER SERVICE CARD

System Saver® didn't become the Apple's number one selling* peripheral by being just a fan.

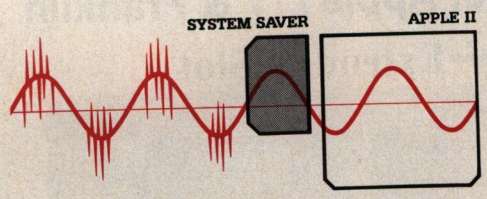
What made over 100,000 Apple® owners fall in love with System Saver? The answer is simple. It's the most versatile, most convenient, most useful peripheral ever made for the Apple.

System Saver filters out damaging AC line noise and power surges.

70-90% of all microcomputer malfunctions can be traced to power line problems.** Problems your System Saver guards against.

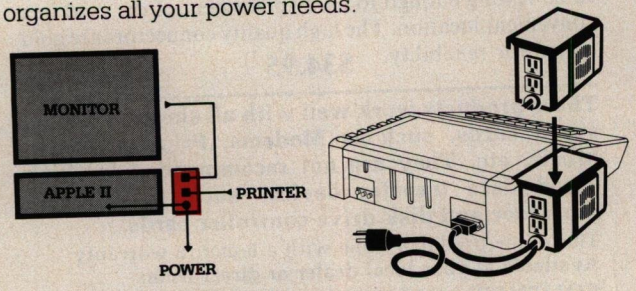
Power line noise can often be interpreted as data. This confuses your computer and produces system errors. Power surges and spikes can cause severe damage to your Apple's delicate circuitry and lead to costly servicing.

System Saver clips surges and spikes at a 130 Volts RMS/175 Volts dc level. A PI type filter attenuates common and transverse mode noise by a minimum of 30 dB from 600 kHz to 20 mHz with a maximum attenuation of 50 dB. You end up with an Apple that's more accurate, more efficient and more reliable.



System Saver makes your Apple more convenient to use.

No more reaching around to the back of your Apple to turn it on. No more fumbling for outlets and cords to plug in your monitor and printer. System Saver organizes all your power needs.

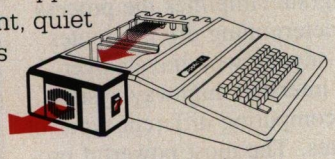


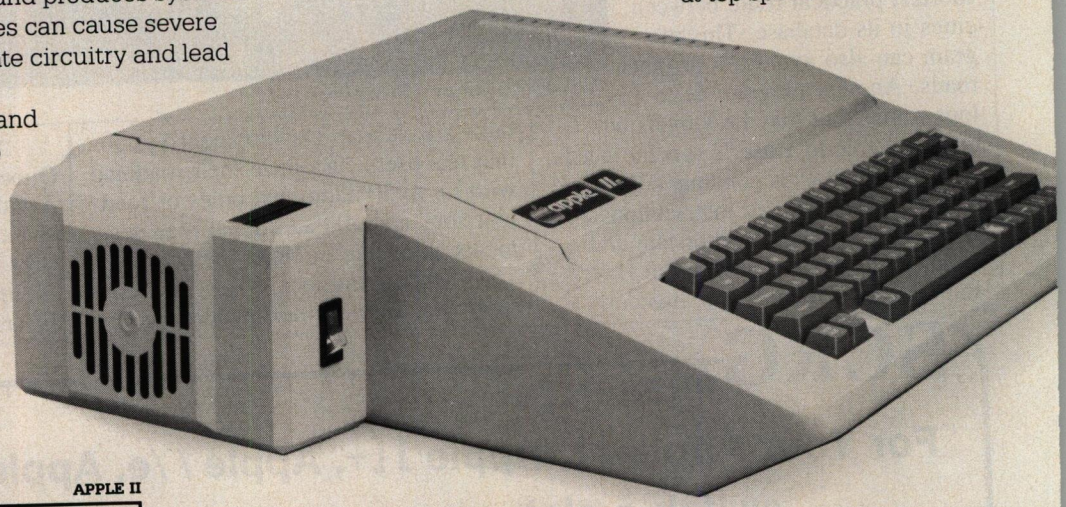
It functions as a multi-outlet power strip with two switched outlets. Plus System Saver offers the ultimate convenience; a front mounted power switch for fingertip control of your entire system.

System Saver lets your Apple keep its cool.

Today's advanced peripheral cards generate heat. In addition, the cards block any natural air flow through the Apple IIe creating high temperature conditions that shorten the life of the Apple and peripheral cards.

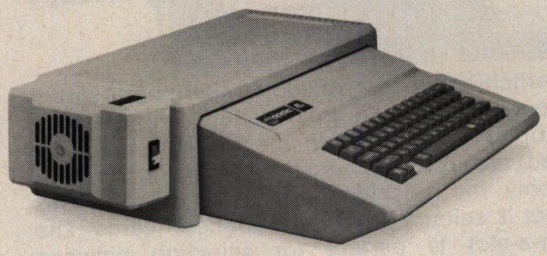
System Saver's efficient, quiet fan draws fresh air across the mother board, over the power supply and out the side ventilation slots. It leaves your Apple cool, calm and running at top speed.





So if you want to keep damaging heat, line noise and power surges out of your system for good, pick up the only peripheral that's in use every second your computer is in use. The System Saver. You'll soon come to think of it as the piece Apple forgot.

Compatible with Apple stand



$89.95 at Apple dealers everywhere.

KENSINGTON MICROWARE
251 Park Avenue South, New York, NY 10010
(212) 486-7707 Telex: 236200 KEN UR

CIRCLE 132 ON READER SERVICE CARD

*Softsel Computer Products Hot List. **PC Magazine: March 1983.

System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Available in 220/240 Volts, 50/60 Hz.

System Saver is a registered trademark of Kensington Microware Ltd.
© 1983 Kensington Microware Ltd. System Saver is patent pending.

play, a Tilt feature, and a scoreboard that keeps track of four players' points and displays the all-time high score. (*List Price: $39.95*)
Requires: 48K; Apple II, II Plus, IIe, or III; one disk drive.
Strategic Simulations, Inc.
883 Stierlin Road, Bldg. A-200
Mountain View, CA 94043
(415) 964-1353

CIRCLE 556 ON READER SERVICE CARD

Coins
A program that lets coin collectors catalogue entire collections and generate various reports for personal-investment purposes.

Coins (computerized inventory of numismatic stock) features a built-in, standard coin file. The file contains a total of 1600 common U.S. coin descriptions, along with their latest market value for most grades. This enables users to track the value of any collection.

Coins also provides special reports showing yearly purchases and sales. Quarterly update diskettes are available that let users keep current on all new coins as well as the latest market prices. Using the software, you can also list and maintain nonstandard coins. (*List Price: $95;* manual/information package, *$10;* quarterly updates, *$25*)
Requires: 48K; Apple II, II Plus, or IIe; one disk drive; 80-column printer.
Compu-Quote
6914 Berquist Avenue
Canoga Park, CA 91307
(213) 348-3662

CIRCLE 557 ON READER SERVICE CARD

Transend 1, 2, 3
An upgraded communications-software product line designed to provide intel-

Compu-Quote's Coins cataloguing program

ISOBAR... the most complete computer protection!

More features to prevent errors, false printout, disc skips! *Only ISOBAR has 3-way spike protection, noise suppression for RFI PLUS isolated filter banks!* Individual filter banks isolate each load from other loads minimizing data errors of *any* kind. MOV surge suppressors arrest both common mode and differential mode surges. L/C filter network rejects radio frequency noise at any amplitude. Torroidal coils for greatest efficiency! All-metal housing.

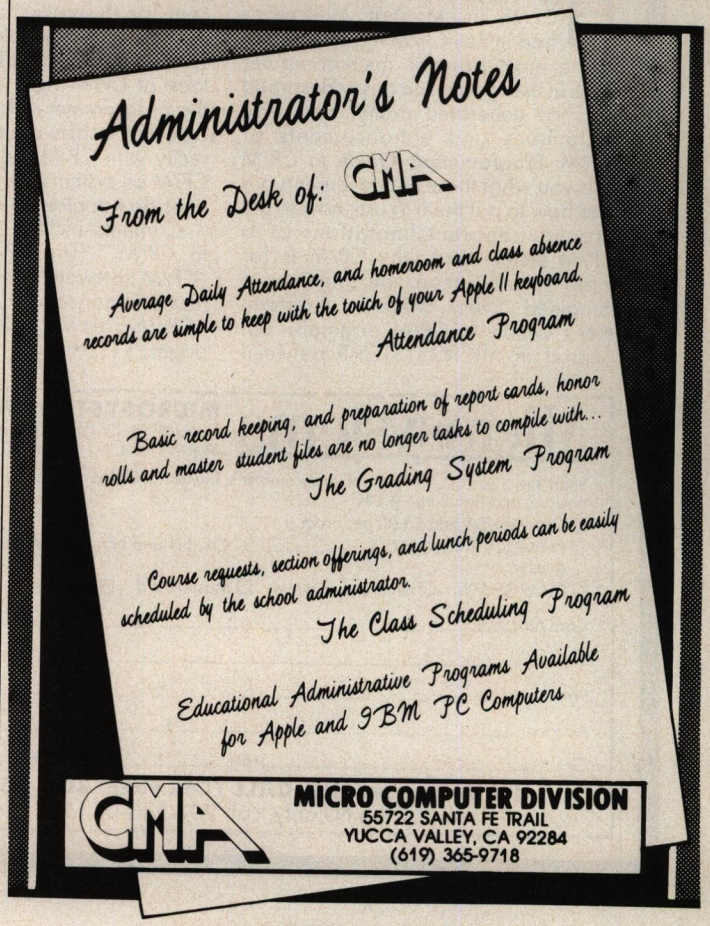
Indus-Tool, 325 W. Huron, Dept. A
Chicago, IL 60610 • Call 1-312-642-6871
Enclosed is $ _____ or charge on
☐ MasterCard or ☐ Visa *Expires* _____
Card no. _____
Name _____
Signature _____
Company _____
Address _____
City _____ State _____ Zip _____

Model IBAR 4-6 (4 outlets, 6 ft. cord) **Only $79.95**

Model IBAR 2-6 (2 outlets, 6 ft. cord) **Only $54.95**

Model IBAR 8-15 (8 outlets, 15 ft. cord) **Only $97.95**

CIRCLE 180 ON READER SERVICE CARD



CIRCLE 165 ON READER SERVICE CARD

ligent-terminal communications, verified file transfer, and electronic mail.

Transend 1, 2, and 3 are designed to incorporate many new features. With auto-configuration, users can enter a particular terminal or peripheral option, and Transend then configures itself automatically. The new software features automatic log-on ability, keyboard macros that combine a series of functions under one keyboard stroke, and "skip-through" menus. With the software, you can program a computer to dial up to eight different systems automatically or to link 22 keyboard macro functions.

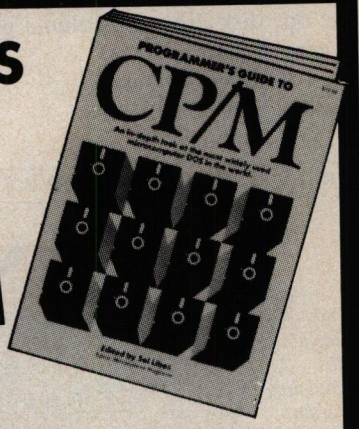
Users can enter a sequence of menu selections from anywhere within the program and page ahead automatically to another program location. (*List Price:* Transend 1, *$89;* Transend 2, *$149;* Transend 3, *$275*. Registered out-of-warranty Transend owners can purchase the upgraded version of the software for $20.)

Requires: 48K; Apple II, II Plus, IIe, or III in the Emulation mode; one disk drive.

Transend Corporation
2190 Paragon Drive
San Jose, CA 95131
(408) 946-7400

CIRCLE 558 ON READER SERVICE CARD

PROGRAMMER'S GUIDE TO CP/M



EDITED BY SOL LIBES

Here's an important collection of CP/M insights that you'll never find in any CP/M manual. CP/M is the most popular microcomputer DOS in use today, and this widespread use has generated many innovative techniques and enhancements of CP/M. *Programmer's Guide to CP/M* tells you what these enhancements are and how to put them to use, how to get around apparent limitations of a CP/M system and why CP/M is far more versatile than you might have imagined. Every article in *Programmer's Guide to CP/M* originally appeared in MICROSYSTEMS between January 1980 and February 1982. Except for this collection, these articles are now unavailable! *Programmer's Guide to CP/M* gives you an in-depth look at CP/M from the viewpoint of the programmer—the individual who creates the software that interfaces directly with CP/M, or who is installing CP/M on systems for which configurations do not already exist.

Contents include "An Introduction to CP/M," "The CP/M Connection," "CP/M Software Reviews," "CP/M Utilities & Enhancement," "CP/M 86" and "CP/M Software Directories." 200 pages, $12.95.

Microsystems

MICROSYSTEMS PRESS
Dept. NF5H, 39 East Hanover Avenue
Morris Plains, NJ 07950

Send me _____ copies of *Programmer's Guide to CP/M* at $12.95 each, plus $2 for postage and handling. #14C
☐ Outside USA add $3.00 per order.
☐ PAYMENT ENCLOSED $_____. CA, NJ and NY State residents add applicable sales tax.
☐ CHARGE MY: ☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____
Signature_____
Print Name_____
Address_____ Apt._____
City_____ State_____ Zip_____

For faster service, CALL TOLL FREE; 800-631-8112
(In NJ only, call 201-540-0445)

A-Stat 83

A statistical-analysis and database package for market research, survey analysis, social and economic modeling, simulations, report writing, teaching statistics, and other research applications.

A-Stat 83 allows you to process data directly from disk files. All routines are menu-driven and prompting or command-driven. The command-driven syntax is a subset language derived from the mainframe and minicomputer system: P-Stat 78.

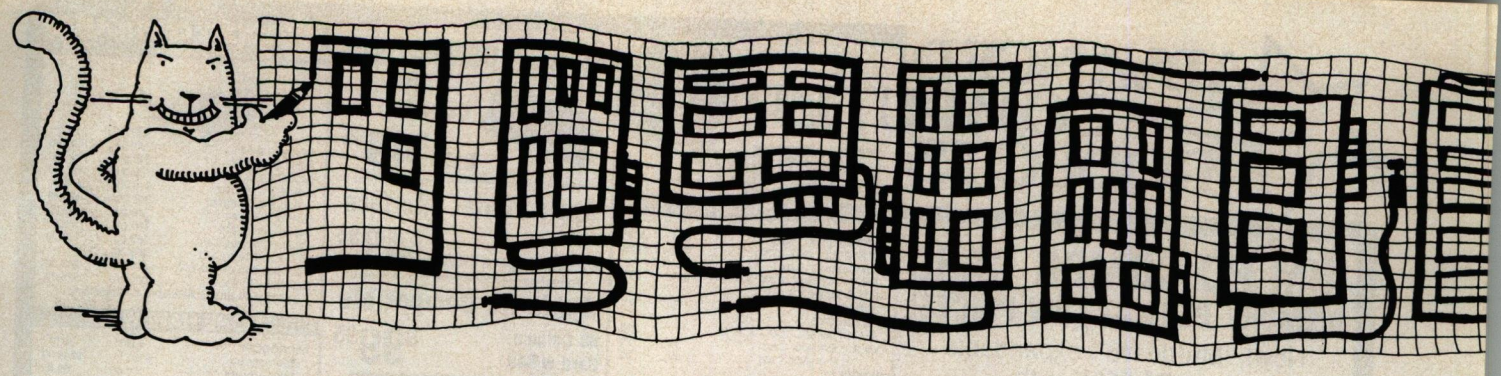
The software includes procedures for univariate variable descriptions, continuous and discrete frequency distributions with histograms, cross-tabulation with over 14 measures of association, correlational analysis with pairwise or listwise deletion of missing data, and more.

A-Stat supports various forms of data entry including full prompting, free format, or fixed format. You can enter data directly from the keyboard, or from system-disk files created by other programs or imported from other computer systems. The package supports full DIF interfaces as well as Apple Plot and File cabinet interfaces.

The software is also available in a CP/M version. (*List Price: $200;* CP/M version, *$300*)

Requires: 48K; Apple II, II Plus, IIe, or III; one or two disk drives; CP/M card required for CP/M version.

Rosen Grandon Associates



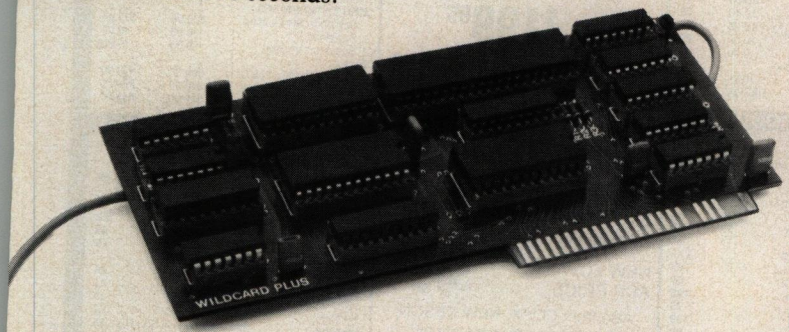
INTRODUCING WILDCARD PLUS.™ THE COPYCARD THAT'S MORE THAN A COPYCAT.

Manufacturers protect their software.
WILDCARD PLUS protects yours.

You have invested a lot of money in software for your Apple® Wildcard Plus makes sure that this investment is protected by making invaluable archival copies.

Rather than copying disks track by track, Wildcard Plus copies your total load programs right from the computer's memory. This creates an accurate copy of the original program.

Now you can back up twice as much in half the time. Because Wildcard Plus doesn't stop at 48K or even 64K, but copies all the way up to 128K on an Apple® IIe. And does it in less than 30 seconds.



In addition, back ups can be quickly booted with or without Wildcard Plus and without messy packing or complicated parameter settings.

No other card is faster, easier to use, or more powerful.

WILDCARD PLUS
unlocks the potential of your Apple.

Wildcard Plus offers a unique system that combines ROM and RAM. ROM allows for fast, easy copies using a simple menu driven system. The RAM permits utility modules to be loaded onto the card. This extends Wildcard's function far beyond that of a mere copycard.

WILDCARD PLUS.
A name that speaks for itself.

Wildcard is the name that stands for uncompromising quality. Which is not surprising when you consider that Wildcard is the runaway leader in the field.

Others compare themselves to the Wildcard, some even copy us. But other copycards can't match the Wildcard's capabilities and reputation.

When you're looking for a copycard you can rely on, look to Wildcard and Wildcard Plus. They are the back up cards that stack the deck in your favor.

Wildcard Plus is available for $189.95. Wildcard for $139.95. Order by phone, (212) 355-2860 or complete the coupon below and send your check, money order, Visa or Mastercard No. to East Side Software Co., 344 E. 63 Street, Suite 14-A, New York City 10021. Dealer inquiries welcome.

Please send _____ **WILDCARD PLUS(S), $189.95 each. Total** _____
Please send _____ **WILDCARD(S), $139.95 each. Total** _____
Include $4.00 for shipping and handling. Outside continental U.S. add $10.00 for shipping and handling. New York State residents add applicable sales tax.
☐ Check enclosed ☐ Visa ☐ Master card

Card No. _____ Expires _____
Name on Card _____
Name _____
Address (UPS delivery) _____
City _____ State _____ Zip _____ Phone _____

East Side Software Co.
344 E. 63 Street, Suite 14-A
New York, NY 10021

WILDCARD PLUS

IMPORTANT NOTICE: The WILDCARD is offered for the purpose of enabling you to make archival copies only. Under the Copyright Law you, as the owner of a copy of a computer program, are entitled to make a new copy for archival purposes only and the WILDCARD will enable you to do so. The WILDCARD is offered for no other purpose and you are not permitted to utilize it for any other use, other than specified. Software is not copy protected. System requirements: Apple II, II Plus or Apple IIe and DOS 3.3. Franklin Ace also supported.

Wildcard and Wildcard Plus are trademarks of East Side Software Co.

CIRCLE 169 ON READER SERVICE CARD

© 1983 East Side Software Co.

ADVANCED COMPUTER PRODUCTS

SEND $2.00 for 1983 CATALOG

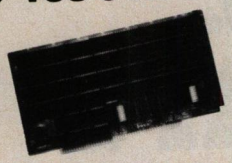
IBM PC

IBM PC COMBO CARD
MEMORY PLUS AT LOW PRICES!

Now! "**Multicard**" expandable from **64-256K** with
(1) PARALLEL (1) SERIAL
(1) CLOCK/CALENDAR

COEX 64 SPC with 64K **$229.00**
COEX 256 SPC with 256K **$399.00**

S-100 64K "CMOS" RAMCARD



Unbelievable Price!
$299.00
Assembled and Tested

- ACP has sold over 1000 of these IEEE compatible, low-priced, high-reliability 64K Static RAM Cards.
- Single 5-Volt operation.

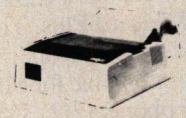
SIEMEN'S SALE

8" Disk Drives **$169.00**

You can now purchase Shugart compatible 8" Disk Drives below your existing factory direct pricing!
These Prices are the lowest ever published.
***Siemen's SSDD FDD100-8.. $169.00**
Also, with purchase of Disk Drives you can buy the **Vista V-1000** Dual Case with Power Supply and Cable for only **$375.00** . . . . Regular Price $495.00
Offer Limited! Factory Warranty 90 Days!
Shipped Immediately from Stock! *OEM Quantities

DOT MATRIX PRINTER
COEX 80-FT

- 9x7 Dot Matrix,80 CPS, Bi-Directional Printing
- 2K Buffered Memory
- 80, 96, 132 Columns, Graphics and Block Printing
- Selectable Char Pitch, Line Spacing and Feed



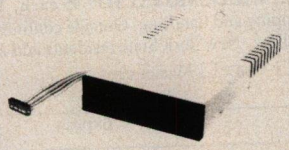
COEX Interface Card to Apple **$49.95**

$199.00

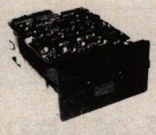
ACP HAS DISK DRIVES

APPLE II™ COMPATIBLE

Thin Line Drive

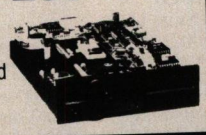


$249.00



TANDON 100-2
PC Compatible • Double Sided
$289.00

TOSHIBA Half-High
PC Compatible • Double Sided
$249.00



OTHER DRIVES WE STOCK

TANDON 848-2 Thinline $479.00	**SHUGART 801R**. $399.00
TEAC FD55B 299.00	**SHUGART 860 Thinline** 479.00
PANASONIC C155 (PC Comp) . . 259.00	**SHUGART SA400**. 210.00
MPI B52. . . . . 279.00	**SEAGATE ST506** (6MB Win.) . . . 599.00

HARDWARE

	List	ACP
AST Megaplus™ Card P/N MG064 (64K, S, C)	395	$279
•Comboplus™ Card P/N MC-064SPC (64K, S, P, C)	395	279
•PC I/O Plus II™ Card P/N I/O (C, S)	165	115
•"SIX PACK" P/N SP064SPC (64K, S, P, C)		299
COEX Extender Card	40	29
Prototype Card	69	35
HERCULES Hercules Graphic Card		379
MOUSE SYSTEMS Mouse for IBM		269
MICROSOFT Mouse plus Multitool Word		Call
M&R 6 Slot Expansion Chassis for IBMPC/XT or Eagle etc		439
ORCHID Hi-Res Graphics Adaptor		395
		339
PERSYST Spectrum (64-256K) P/N SP64, (64K, Clk, S, P)		319
PLANTRONICS Color plus™ Card		469
QUADRAM Quadboard (64-256K) P/N Q64, 64K w/4 functions	395	279
QuadLink Apple Card	680	525
Quadboard 64K		279
Microfazer Print Buffer MP-64		190
Quadchrome (Hires RGB)		488
RIXON PC212A Modem I/O	596	449
SSM Transmodem 1200		479
USI Multidisplay Card		299
VISTA "Multicard™" (exp. 64-256K) P/N V-064 (64K, Clk, S, P)	395	229
P/N V-256 (256K, Clk, S, P)	695	399
•"Maxicard™" (up to 576K) P/N V-576-64K		249
P/N V-576-576K		729
•"PC Master" (10 I/O)	495	329
•"PC Extender" (up to 10 I/O)	249	199
•"Diskmaster"	299	199
•8" Thinline Dual Floppy		Call
•V1200 6.2Mb Cartridge Drive		999

PRINTERS

COEX 80F/T 80cps	$299	$199
DYNAX Daisywheel		525
SILVER REED EXP500 132 Column		649
STAR MICRONICS - NEW! Gemini 10X 120cps	399	319
Gemini 15 15"	599	399
EPSON FX80	699	549
FX100	895	749
BROTHER HR-1/BMC	1195	895
DAISYWRITER	1495	1295
TTX Daisywheel		549
NEC Spinwriter 3550		1875
IBM PC to Parallel Cable	60	39

MONITORS

AMDEK CORP 300 Green 12"	$199	$155
310 Amber 12"	210	175
Color I Composite/Hitachi	399	339
Color II RGB Hi-Res	899	695
BMC 12" Green	129	89
PRINCETON GRAPHICS RGB IBM Lookalike	700	545

DISKETTES

DYSAN 5¼" SS SD	10/$55	$38
DYSAN 5¼" DS SD	10/65	48
IBM 5¼" SS SD	10/60	43
IBM 5¼" SS DD	10/65	47
VERBATIM 525-01 SS	10/45	23
VERBATIM 550-01 DS	10/55	34
MAXELL MD1 SS	10/50	29
MAXELL MD2 DS	10/60	39
Flip Storage Box 5¼" (80 disks)		19
BULK SPECIAL SS	10/25	19
With Sleeve and Box	100/195	149

MORE IBM GOODIES

COMPUCABLE Keyboard & Drive Covers (set)		$19
CURTIS PC Pedestal	$80	64
PGS or Quadchrome Adaptor		10
Vertical PC System Stand		20
IBM Mono Extension Cable	50	44
Keyboard Ext. Cable (3-9')		34
EPD PROTECTION DEVICES The Lemon (Surge Protector)		43
The Peach (Surge Protector)		68
The Orange (with EMI/RFI)		122
The Lime		76
INTEL 8087 IC		199
KOALA PAD		99
KRAFT Joystick IBM	70	40
RAM EXPANSION 16K Motherboard (16 IC's)		19
64K Memory Exp. (9 IC's)		50

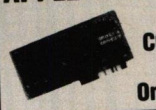
TIME SHARE SERVICES

COMPUSERVE Subscription	$40
SOURCE Subscription	75

MODEMS

HAYES Smartmodem 300	$210
PC Modem Software 1.3 (above)	49
Smartmodem 1200	525
PC Software 1.4C (above)	79
Smartmodem 1200B	445
Smartcom II	79
Smartmodem to IBM Cable	25

APPLE™ COMPATIBLE DISK CONTROLLER



Only **$49.95**

Apple Printer Interface

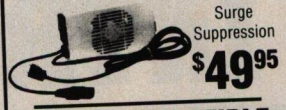
w/Apple to Epson Cable **$49.95**

Apple IIe Compatible

80 Column Card w/64K **$99.95**

APPLE COOLING FAN

with Surge Suppression



$49.95

APPLE COMPATIBLE POWER SUPPLY

+ 5V @ 5A
+12V @ 3A
−12V @ .25A
− 5V @ .25A

$79.95

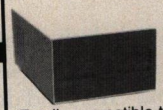
APPLE COMPATIBLE JOY STICK

only **$15.95**

Vista Computer Company

VISTA V1200
6.2 Cartridge Drive w/Controller
Apple or IBM Compatible
Please Specify with Order **$999.95**

VISTA "SOLO"



Apple II/IIe Compatible Disk Drive
Totally compatible to Apple Drives.
Only $199.95
Controller **$49.95**
Just plug in and run.

Apple II 16K RAM CARD
Compatible with
Z80 Softcard™ . PASCAL CP/M™
Full 1 year Warranty. Top Quality by COEX
NEW LOW ACP PRICE **$49.95**
Also from COEX, **NEW** EPSON Parallel Interface for Apple.
With cable **$49.95**

VISTA A800
8" Disk Controller
for Apple **$299.95**

VISTA "DISKMASTER"
IBM Compatible
3", 5", 8" and V1200 Compatible **$199.95**

apple computer
Authorized Dealer

	LIST	ACP
Apple IIe w/64K	$1395.00	$1195.00
Apple IIe System	1995.00	1695.00
Apple IIe Sys w/Ext Text	2195.00	1895.00
Disk II w/Controller	545.00	449.00
Disk II w/o Controller	395.00	359.00
Monitor III Green	249.00	189.00
Super Serial Card	195.00	169.00
Parallel Interface Card	165.00	139.00
80 Column Text Card	125.00	
Extended 80 Column Text	295.00	249.00
Dot Matrix Printer	695.00	529.00

"Apple Products Available In-Store Only"

MORE HARDWARE

	LIST	ACP
MICROSOFT Z80 Softcard	$395.00	$249.00
16K Ramcard	195.00	89.00
SSM AIO-II 4 Function Serial/Parallel	225.00	179.00
EASTSIDE Wildcard Apple II	149.00	115.00
KENSINGTON System Saver	89.95	69.00
KEYBOARD COMPANY Numeric Keypad	149.95	124.95
Apple II Joystick	49.95	44.50
Apple II Hand Controllers	29.95	25.95
KRAFT Joystick		49.00
Hand Controller		40.00
MPC 128K Bubble Memory	875.00	699.00
PROMETHEUS VERSAcard Four-in-1	199.00	166.00
VISTA COMPUTER CO. A800 8" Disk Control	379.95	299.00
Quartet Disk Drive 5¼"	849.00	799.00
Solo Disk Drive w/Contr	299.00	249.00
Solo Drive w/o Contr	249.00	199.00
Vista 5¼" Disk Contr	92.00	49.00
Typehead Buffer	49.95	35.00
VIDEX Videoterm 80x24 Card	345.00	279.00
Keyboard Enhancer II	149.00	129.00
Soft Switch	35.00	30.00
Function Strip Keys	79.00	69.00
PRACTICAL PERIPHERALS 16K Microbuffer	259.00	220.00
32K Microbuffer	299.00	253.00
Snapshot Option	149.00	109.00
VOTRAX Type n'Talk Speech	249.00	219.00
Personal System	395.00	339.00
VYNET Apple II Voice Syn.	395.00	349.00
Apple II Telephone I/O	295.00	249.00
SCOTT INSTRUMENTS Voice Recognit'n VET80	799.00	675.00
COEX 16K RAM Card	99.00	49.95
Parallel Card w/Cable	99.00	49.95
Apple Protocard	29.00	19.95
Apple Extendercard	29.00	19.95
Apple IIe Ext RAM Card	199.00	99.95
CORVUS		Call
ORANGE MICRO The Grappler I/O (Plus)	175.00	139.00
The Bufferboard	175.00	139.00
SATURN SYSTEMS 32K RAM Card	219.00	179.00
128K RAM Card	499.00	439.00
STREET ECHO II	149.00	129.00
LEGEND 64KC II/IIe	327.00	269.00
128KC II/IIe	599.00	499.00
18SRC 18K Static	149.00	135.00
MICROPRO Wordstar w/CP/M	499	415
MOUNTAIN COMPUTER CPS Multifunction	239.00	169.00
Music System	395.00	335.00
A/D plus D/A	350.00	299.00
ROM Plus	155.00	129.00
M&R ENTERPRISES Sup'rterm 80x24 Card	395.00	269.00
Sup'rMod II	69.00	49.00
Sup'rMod V (IBM)	69.00	49.00
ALS The CP/M Plus Z80 Card	399.00	329.00
Smarterm 80x24 Card	349.00	279.00
The Synergizer Package	699.00	549.00

Apple Compatible Software

SAVE UP TO 40%

BUSINESS		ASCII Exprs, Prof.	99
Screen Writer	$129	**HOBBY**	
BD Master	155	Zoom Graphics	32
Visicalc™ 3.3	185	Utility City	22
Visiplot	159	Locksmith 4.0	90
PFS, File II	115	Nibbles Away II	49
PFS, File III	155	**GAMES**	
Visitrend/Visiplot	25	Choplifter	26
PFS, Graph II	115	Frogger	24
PFS, Graph III	155	Wizardy	39
Multiplan	199	Snack Attack	24
Versaform	279	Cannonball Blitz	26
Wordstar	299	Knight Diamonds	26
dBASE II	439	Zork I	29
Supercalc	169	Zork III	29
PFS, Report II	95	Starcross	29
PFS, Report III	115	Serpentine	25
Acct Plus G/L	299	Star Blazer	25
G/L, A/P, A/R	599	Deadline	39
Above + Inventory	799	Tubeway	25
Magic Window	115	Flight Simulator	25
HOME		Space Vikings	43
Home Accountant	59	Sargon II	29
Transend I	76	Spitfire Simulator	29
Transend II	119	Apple Panic	22
Visiterm	89	Olympic Decath	23

Apple™ Apple Trademark of Apple Computer
IBM™ IBM Trademark of International Business Machines

TERMS: MO. Cashier's Check. Bank Wire. Personal checks allow 2 weeks for processing. Include Drivers License and credit card #'s Visa, AMEX. CB add 3% service charge. Add 3% shipping & handling or $2.50, whichever is greater. Add 10% for foreign orders or US Parcel Post. Include Telephone number. NO CODs. Prices subject to change without notice. Some items subject to prior sale. We reserve the right to substitute manufacturer. Retail prices may vary.

TOLL FREE
800-854-8230
TWX
910-595-1565

Mail Order: P.O. Box 17329 Irvine, CA 92713
Retail: 13108 E. Edinger, Santa Ana, CA 92705
(714) 558-8813
542 W. Trimble, San Jose, CA 95131
(408) 946-7010

CIRCLE 250 ON READER SERVICE CARD

PRODUCT NEWS

7807 Whittier Street
Tampa, FL 33617
(813) 985-4911

CIRCLE 559 ON READER SERVICE CARD

filePro

filePro is database-management software that can be used in a variety of applications, from maintaining bibliographies to organizing insurances evaluations.

In filePro, programs are accessed through menus, and prompts are supplied for every operation in a program. Files can be organized alphabetically, numerically, by date, or by any of 32 other available categories. Up to ten labels and reports or mailing lists can be designed and printed for each file. The program prints up to 14 inches wide and 11 inches deep.

Math formulas can be calculated automatically for such items as balance due, tax rate, commission, and price extension. All formulas in a file, or in a select group of records, can be recalculated at once.

The program accepts up to 65,535 records per file and 99 fields, 1020 characters per record. The software is written in assembly language for fast operation. *(List Price: $300, complete with Microsoft CP/M Softcard)*

Requires: 64K; Apple II, II Plus, or IIe; Microsoft CP/M SoftCard; two disk drives.

The Small Computer
Company, Inc.
230 W. 41st Street, Suite 1200
New York, NY 10036
(212) 398-9290

CIRCLE 560 ON READER SERVICE CARD

Quiz Master

A program to aid development and duplication of custom educational software, Quiz Master allows the user to create and save, on disk, quizzes of up to 50 multiple choice or true/false questions and, on a single diskette, up to 250 student records. Students can take the tests on computers and their results will be stored on disk, or multiple copies of each test can be printed with different arrangements of question-and-answer keys.

The program includes password protection to prevent unauthorized access to data; mastery and failure levels, which can be set for minimum scoring to continue to the next quiz or return to the previous quiz; and a summary output report showing data for all students. The program is written in assembly language for speed and offers graphics capabilities. *(List Price: Unlimited Single License $99.95; additional licenses $29.95)*

Sunshine Software
P.O. Box 707
Cortland, NY 13045

CIRCLE 561 ON READER SERVICE CARD

APPLE II Outperforms IBM PC with MegaTASK PLUS™

MegaTASK PLUS™ is a combined, multi-product hardware-and-software package that provides **MEGABYTES** of **VIRTUAL MEMORY, MULTITASKING,** and much more to your Apple or Apple compatible computer. MegaTASK PLUS utilizes the SMARTCHIP™ (which uses an Intel 8748 Single-Chip Microcomputer), MegaTASK™ & MegaDOS™ software, and more. Your system will be enormously enhanced, specifically:

- **MULTITASKING** (as many as 16 TASK can execute at one time). Ex. Several printers can be printing while you do data-entry.
- **MEGABYTES** of **VIRTUAL MEMORY.** Largest program size 8 Megabytes. Largest ISAM file 451 Megabytes.
- **Mainframe Basic commands** bring machine-language speeds to interpretive Basic.
- **Increased Speeds.** Program execution and file access up to 10 times faster, and data transfer up to 20 times faster.

On the application side, the 'PLUS' portion includes:

- Business Graphics, Calc, Database Management and Word Processing Applications Packages.
- Report Generators and Strategic Business Analysis programs.
- Communications programs.
- Text Manipulators and Program Editors.
- And much much more!

MegaTASK PLUS includes: the SMARTCHIP, Two Manuals of over 400 pages, Three Double-Sided diskettes packed with software, a 60-Day-Trial period, a one-year Warranty, and more. . .

MegaTASK PLUS and one-free-year of our Applications Software Package Series are available at a cost of $495.00. Contact your Local Dealer or order DIRECT. Add $4.00 for shipping. Virginia residents add 4% sales tax. We accept VISA and MASTERCARD, Money Order, or Check.

DATA LINK, INC.
1225 Jefferson Davis Hwy., Suite 600
Crystal Gateway II
Arlington, Virginia 22202 **(703) 486-5701**

*Apple and Apple II are Trademarks of Apple Computer, Inc.
IBM PC is a Trademark of IBM, Inc.

CIRCLE 263 ON READER SERVICE CARD

APPLEWARE, INC.

The Apple Users Group
Software Library Bonanza
At truly affordable prices!
For the first time enjoy your Apple to its fullest capacity, using specially **packed disks with over 60 outstanding programs each.**
(not available from any other source)

Each packed disk includes an extensive variety of interesting, useful and entertaining programs indispensable to all computerists! Each mixed category packed disk includes:

BUSINESS • EDUCATIONAL • DATA BASE • GAMES UTILITIES • SCIENCE • MUSIC • GRAPHICS • FINANCE

Library Disks I, II and III are mixed categories. Dedicated disks are:

• GAMES • UTILITIES • GRAPHICS • INTEGER • SCIENCE & TECHNOLOGY. Each packed disk is available for only $59.95 each.

WHY PAY MORE?

Order direct from this ad and **Save up to $150.** Buy Library Disks I, II and III and get a special bonus disk **FREE** - over 260 programs for $179.95 + $3. shipping. For the best value, receive all 9 disks featuring over 600 of our best programs for **only 65¢ each** - for a package price of only $389. Postage Paid!

NEW...Business • Professional • Executive Package (enabling you to bring your business to its highest level of efficiency) also available, circle Readers Service Card for our complete catalog.

For Orders Only Call now
TOLL FREE: 1-800-327-8664
Florida: 1-305-987-8665

MasterCard VISA

Compatible with II, II+, IIe, III Emul., and Franklin Ace (For 3.3 DOS)

CIRCLE 245 ON READER SERVICE CARD

ANNOUNCING

A LIBRARY OF SOFTWARE PROGRAMS FOR **APPLE II & IIe** COMPUTERS

A+DISK MAGAZINE

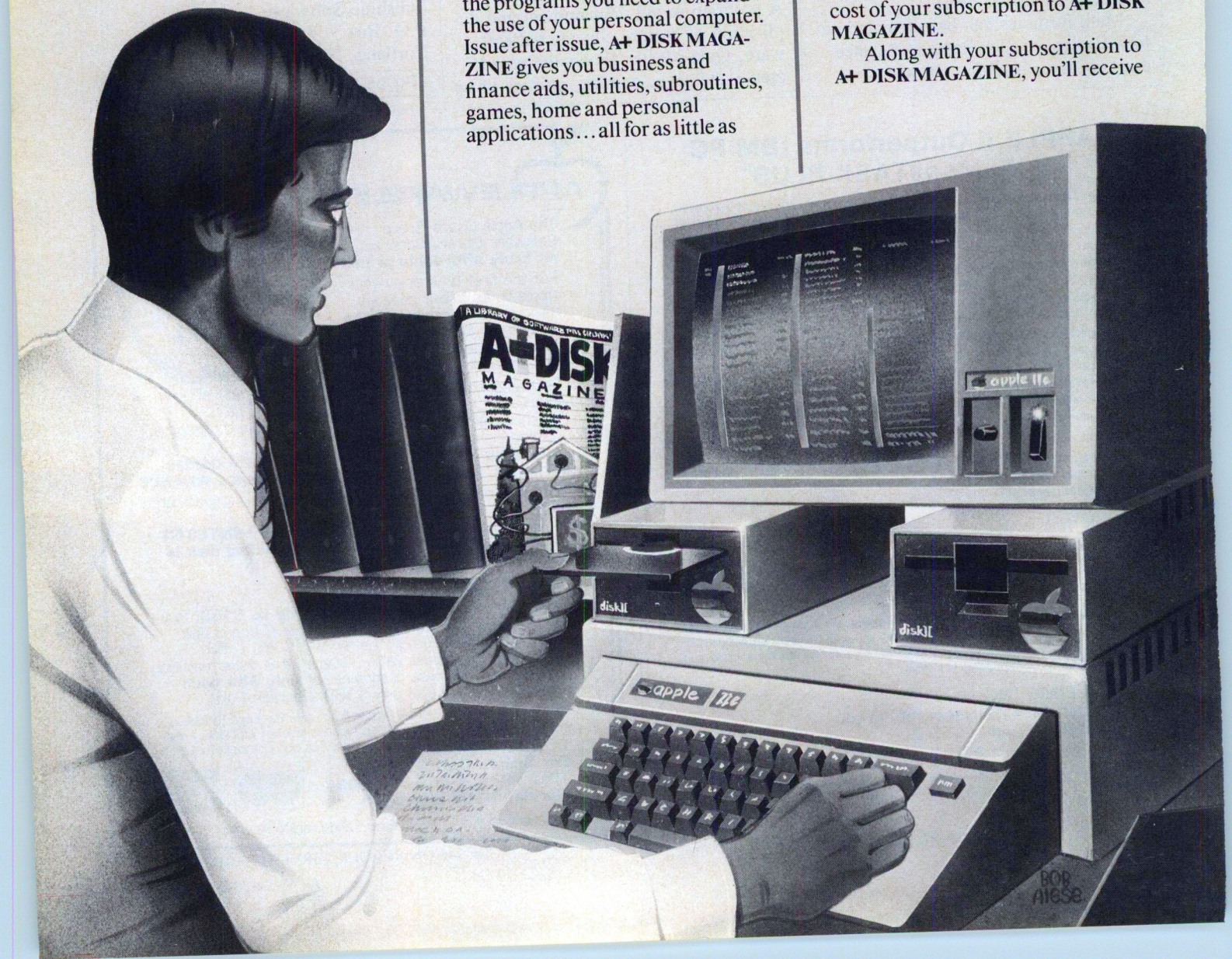
Now you can build a library of programs for your Apple™ at a fraction of the usual cost

Each issue of A+ Disk Magazine provides you with up to 12 programs for as little as $2.00 each.

A+ DISK MAGAZINE is making it easier than ever before to build a library of computer software for your Apple II Microcomputer. Because now you can save 34% on the programs you need to expand the use of your personal computer. Issue after issue, **A+ DISK MAGAZINE** gives you business and finance aids, utilities, subroutines, games, home and personal applications... all for as little as $2 per program.

And when you consider that many of today's most popular programs sell for $50, $60, $80 and more, your savings can be *enormous*... much more than the cost of your subscription to **A+ DISK MAGAZINE**.

Along with your subscription to **A+ DISK MAGAZINE**, you'll receive



up to 12 thoroughly-tested, ready-to-run programs and files on a floppy disk. Complete with comprehensive, illustrated User Manual, **A+ DISK MAGAZINE** is easy, efficient, and very economical.

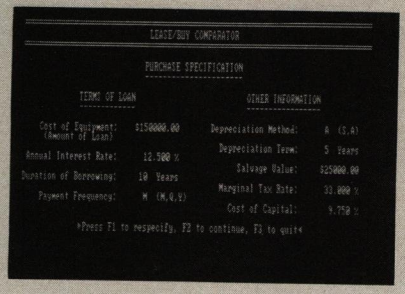
Here's just a sampling of what you can expect in every issue:

Programming tools: Create cross-reference listings for your

BASIC programs. Convert MBASIC™ program files to CBASIC™ format or reverse. Use your text editor on your BASIC programs. Convert data between BASIC and VISICALC® formats.

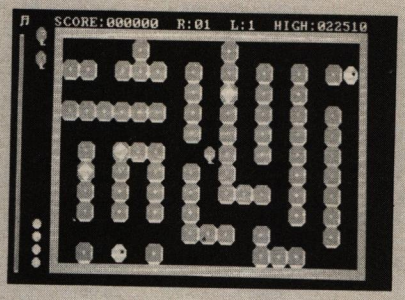
Business and finance aids: Compute loan payment tables. Calculate the Present Value and Internal Rate of Return for your investments. VISICALC templates for Real Estate, Lease/Purchase and Tax Shelter analysis. Create advanced pie, bar and line chart graphics.

Home/personal applications: Whether you need your own income tax return helper... a personal cash flow analyzer... a speed reading trainer... proven ways to maintain a mailing list... or SAT test preparation aids, **A+ DISK MAGAZINE** has it all.



Utilities and diagnostics: **A+ DISK MAGAZINE** shows you how to use your Apple to simulate a conversational terminal with function key control of disk or printer logging... print graphics, screen images on your printer... backup, copy, delete, un-delete or type files with simple menu commands... plus more.

Data files: From tax tables, to population statistics, from dictionaries to economic times series, **A+ DISK MAGAZINE** involves you as never before.



Games: Adventures! Strategies! Test your skill, intelligence and luck.

The latest software developments at your fingertips for a fraction of the cost.

There's no need to type listings into your computer. With **A+ DISK MAGAZINE**, all you do is boot the disk and go! The accompanying User Manual explains everything in clear, easy-to-understand terms. So you'll be able to run the programs as soon as you receive your first issue of **A+ DISK MAGAZINE**.

Save $60 with this Introductory Offer. Get 6 issues of A+ Disk Magazine and save 34%

Program Submissions

If you wish to submit a program for inclusion in future issues, please write to: **A+ DISK MAGAZINE**, Attn: Editor, One Park Avenue—Dept. 732, New York, N.Y. 10016.

Guarantee

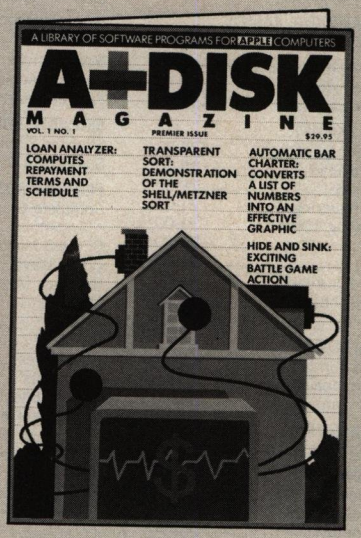
- All programs are fully tested and guaranteed to run. Damaged or faulty disks will be replaced at no charge.
- If you wish to cancel a subscription, simply return the most recent disk in its sealed package and you will receive a full refund for this copy and all unmailed issues.

Product Specifications

Programs will run on Apple II computers using Apple DOS 3.3 and require a minimum of 64K. Most programs will be written in Applesoft Basic—however some machine language code may be used.

Most programs will be written to run on both monochrome and color displays; however, some games and utilities may be specifically developed for color displays.

Programs and documentation are copyrighted by Ziff-Davis Publishing Company. All rights of reproduction in all forms and media strictly reserved.



A+DISK MAGAZINE

P.O. Box 2469
Boulder, Colorado 80322

YES. Please accept my subscription to **A+ DISK MAGAZINE** for 6 issues at the Special Introductory Price of just $119 (less than $20 per issue, as little as $2 per program). I save 34% off the full price of $179.

Check one: ☐ I enclose $_____. (Residents of CA, CO, CT, DC, FL, IL, MA, MI, MO, NJ, NY State, and VT add applicable sales tax.)
☐ Please bill me.

Please charge to my credit card. ☐ American Express ☐ Visa ☐ MasterCard

Credit Card No._____ Exp. Date_____

Name_____

Address_____

City_____ State_____ Zip_____

8H054

MAIL NO-RISK COUPON TODAY—AND SAVE 34%!

SAVE UP TO 40%

TOLL FREE ORDER LINE

SAVE!

No Hidden Charges
No Charge for Credit Cards
No Shipping Delay for Personal Checks

AVANT-GARDE CREATIONS
HIRES Computer Golf $21.00
HIRES Computer Golf 2 ..... 25.00
Jump Jet 21.00

BEAGLE BROTHERS
Alpha Plot $28.00
Aplle Mechanic 21.00
Beagle Bag 21.00
DOS Boss 20.00
Double Take 25.00
Flex Text 21.00
Frame Up 21.00
Pronto DOS 21.00
Tip Disk #1 ..... 15.00
Typefaces 15.00
Utility City 21.00

BRODERBUND
AE $25.00
Arcade Machine 42.00
Bank Street Writer 48.00
Choplifter 25.00
Gumball 21.00
Lode Runner 25.00
Maze Machine 42.00
Midnight Magic 25.00
Questron 32.00
Sea Fox 21.00
Serpentine 25.00
Spare Change 25.00
Star Blazer 23.00

BUDGECO
Pinball Construction Set $28.00
Raster Blaster 21.00

CALIFORNIA PACIFIC
Ultima $28.00

CONTINENTAL SOFTWARE
The Home Accountant $53.00

DATAMOST
Aztec $28.00
Bilestoad 28.00
Casino 28.00
Conquering Worlds 21.00
Mating Zones 21.00
Missing Ring 21.00
Pig Pen 21.00
Snack Attack 21.00
Swashbuckler 25.00
Thief 21.00

DATASOFT
Canyon Climber $21.00
Micropainter 25.00
Zaxxon 28.00

DATA TREK
Maze Craze $28.00

EDU-WARE
Algebra 1-4 ..... $28.00
Algebra 5 & 6 ..... 35.00
Compu-Read 21.00
Decimals 35.00
Fractions 35.00
Prisoner 2 ..... 25.00
Rendezvous 28.00

EPYX
Crush, Crumble & Chomp $21.00
Hellfire Warrior 28.00
Temple of Apshai 28.00

H.A.L. LABS
Sheila $20.00
Super Taxman 2 ..... 20.00

HAYDEN SOFTWARE
Go $25.00
ORCA/M 70.00
Sargon II 25.00

INFOCOM
Deadline $35.00
Starcross 28.00
Suspended 35.00
The Witness 35.00
Zork I, II, & III .....ea. 28.00

INTELLIGENT STATEMENTS
Ken Uston's Professional Blackjack $49.00

LIGHTNING SOFTWARE
Master Type $28.00

MICROLAB
Miner 2049er $28.00

MICROSOFT
Adventure $21.00
Olympic Decathalon ... 21.00
Typing Tutor II 20.00

MUSE
Castle Wolfenstein ... $21.00
Caverns of Freitag 21.00
Robot War 28.00
Three Mile Island 28.00
Titan Empire 28.00

ODESTA
Checkers $35.00
Chess 7.0 ..... 49.00
Odin 35.00

OMEGA MICROWAVE
Inspector $45.00
Locksmith 4.1 ..... 75.00
Night Falls 21.00
Watson 35.00

ORIGIN SYSTEMS
Exodus: Ultima III $40.00

QUALITY SOFTWARE
Ali Baba $25.00
Bag of Tricks 35.00
Beneath Apple Manor . 21.00
Fastgammon 18.00

SENSIBLE SOFTWARE
Sensible Speller $100.00
Super Disk Copy 21.00

PENGUIN SOFTWARE
Complete Graphics System $49.00
Coveted Mirror 15.00
Crime Wave 15.00
Graphics Magician 45.00
Minit Man 15.00
Pensate 15.00
Pie Man 15.00
(The) Quest 15.00
Short Cuts 35.00
Special Effects 28.00
Spy's Demise 15.00
The Spy Strikes Back .. 15.00
Thunderbombs 15.00
Transylvania 15.00

SIERRA ON-LINE
Adv. #1 Mission Asteroid $15.00
Adv. #2 Mystery House 18.00
Adv. #3 Wizard & The Princess 25.00
Adv. #4 Ulysses 25.00
Adv. #5 Time Zone 70.00
Adv. #6 Dark Crystal .. 28.00
Apple Cider Spider 21.00
Bop-A-Bet 21.00
Cannonball Blitz 25.00
Crossfire 21.00
Dragon's Keep 21.00
Frogger 25.00
Jawbreaker (new) 21.00
Learning w/Leeper 25.00
Marauder 25.00
Sammy Lightfoot 21.00
Softporn Adventure ... 21.00
Threshold 20.00
Troll's Tale 21.00
Ultima II 42.00
The Artist 60.00
Screenwriter II 99.00
General Manager 175.00

HARDWARE DEALS

MODEMS
Apple Cat II ..$299.00
Micromodem II 265.00
Micromodem w/terminal prog. 295.00
212 Apple Cat . 580.00

MONITORS
Amdek
Color I $299.00
Color II RGB ... 599.00
Color III RGB .. 399.00
RGB Card 149.00

USI
Pi1 9" Green .$119.00
Pi2 12" Green . 149.00
Pi3 12" Amber. 159.00
Pi4 9" Amber .. 129.00
Color 1400 .... 299.00

PRINTERS
C. Itoh
GX-100 .....$229.00
Prowriter 399.00
Okidata
Microline 80 ... 349.00
Microline 82A . 449.00
Microline 92 ... 549.00

SILICON VALLEY SYSTEMS
Word Handler/List Handler package $149.00

SIRIUS
Critical Mass $28.00
Epoch 25.00
Gorgon 28.00
Repton 28.00
Plasmania 25.00
Type Attack 28.00
Wayout 28.00

SIR-TECH
Galactic Attack $21.00
Knight of Diamonds ... 25.00
Legacy of Llylgamyn .. 29.00
Police Artist 25.00
Star Maze 25.00
Wizardry 35.00

SOFT IMAGES
Blackjack Strategy ... $49.00
Pandemonium 28.00
Single's Night at Molly's 21.00

SOFTWARE PUBLISHING
PFS: File $95.00
PFS: Graph 95.00
PFS: Report 95.00

SPINNAKER
Delta Drawing $35.00
Face Maker 25.00
Hey Diddle, Diddle 21.00
Kindercomp 21.00
Most Amazing Thing .. 28.00
Rhymes & Riddles 21.00
Snooper Troops 1 & 2 ea. 32.00
Story Machine 25.00

STRATEGIC SIMULATIONS
Bomb Alley $42.00
Computer Ambush 42.00
Computer Baseball 28.00
Computer Quarterback 28.00
Cosmic Balance 28.00
Cosmic Balance II 28.00
Galactic Adventures ... 42.00
Geopolitique 1990 .... 42.00
Germany 1985 ..... 42.00
Knights of the Desert .. 28.00
North Atlantic '86 ..... 42.00
RDF '85 ..... 25.00
Tigers in the Snow 28.00
Warp Factor 28.00

SUB-LOGIC
Flight Simulator $25.00
Pinball: Night Mission . 21.00
Road Block 21.00
Saturn Navigator 25.00
Space Vikings 35.00

SYNERGISTIC
Atlantis $28.00
Crisis Mountain 25.00
Bolo 25.00
G.P.L.E. 49.00
Microbe 32.00
Odyssey 21.00

SYDNEY DATA PRODUCTS
Evolution $28.00

ULTRASOFT
Mask of the Sun $28.00
Serpent's Star 28.00

VISICORP
VisiCalc 3.3 ..... $175.00
VisiCalc IIe 175.00
VisiDex 175.00
VisiFile 175.00
VisiLink 175.00
VisiPlot 150.00
VisiSchedule 210.00
VisiTerm 75.00
VisiTrend/Plot 225.00

HARDWARE

JOYSTICKS AND PADDLES
Hayes Mach II $32.00
Hayes Mach IIe 35.00
Hayes Mach III 40.00
Hayes Mach IIIe 44.00
Kraft Joystick 45.00
Kraft Paddles 35.00
Sirius Joyport 36.00
TG Joystick 42.00
TG Paddles 29.00
TG Trackball 48.00

MISCELLANEOUS HARDWARE
Grappler + ... $125.00
16K Ram 75.00
SoftCard 275.00
System Saver 65.00

BLANK DISCS (box of 10)
Elephant (SS/SD) $22.00
(SS/DD) 25.00
Maxell (SS/DD) 30.00
Verbatim (SS/SD) 25.00
(SS/DD) 28.00
Diskette File Box (holds 60) 20.00

DISK DRIVES
Rana Elite 1 ..... $289.00
w/controller 389.00
Rana Elite 2 ..... 479.00
w/controller 559.00
Rana Elite 3 ..... 629.00
w/controller 699.00

VIDEX
Videoterm $239.00
Ultraterm 279.00

ADVANCED LOGIC SYSTEMS
CP/M Card $299.00
Dispatcher 104.00
Z-Card II 129.00

OTHER ITEMS
Gibson Light Pen $249.00
Koala Graphics Tablet . 99.00
S.A.M. 89.00

RISING SUN SOFTWARE
4200 PARK BLVD.
OAKLAND, CALIFORNIA 94602
(415) 482-3391

Ordering Information: We'll accept any form of payment—cash, personal check, money order, VISA/MasterCard, or C.O.D. Send cash at your own risk. Add $2.00 for UPS shipping; $3.00 for Blue Label Air. California residents add applicable sales tax. ALL orders shipped same day received. If we are out of stock on a particular item we will include a special bonus with your order when shipped.

master charge

CALL TOLL FREE 24 HOURS (ORDERS ONLY)
(800) 227-1617, ext. 114 (Outside California)
(800) 772-3545, ext. 114 (Inside California)

VISA

CIRCLE 197 ON READER SERVICE CARD

PRODUCT NEWS

Suspended
A text adventure program featuring functional game board with plastic stick-on robots. In order to save a planet, players must manipulate six robots, each having a different perception of the game's environment, and each offering the players specific options.

Offering four levels of play, Suspended uses a proprietary programming system that enables users to communicate with the game in English.
(List Price $49.95)
Requires: 48K; Apple II or II Plus, one disk drive.
Infocom, Inc.
55 Wheeler Street
Cambridge, MA 02138
(617) 492-1031

CIRCLE 562 ON READER SERVICE CARD

Copy II Plus
A disk-copy program permitting users to make backup copies of protected software, Copy II Plus makes exact copies without modification to the software on the duplicate disk. The Bit Copy option handles synchronized tracks, half tracks, bit insertion, track arcing, and other common copy-protection schemes.

Other Copy II Plus features include: COPY files, DOS, disk; DELETE files, DOS, disk; LOCK/UNLOCK files; FORMAT disk; VERIFY disk, files, drive speed; VIEW files; FIX file sizes; TRACK/SECTOR MAP; CHANGE BOOT PROGRAM; SECTOR EDITOR; and CATALOG, with file lengths, hidden characters, and deleted files. *(List Price: $39.95)*
Requires: Apple II, II Plus, IIe, or III; 48K; one disk drive.
Central Point Software, Inc.
P.O. Box 19730, #203
Portland, OR 97219
(503) 244-5782

CIRCLE 563 ON READER SERVICE CARD

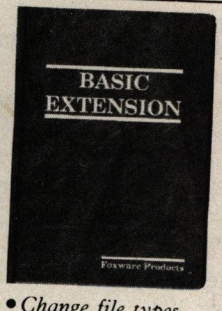
In Search of the Most Amazing Thing
In Search of the Most Amazing Thing is an adventure game featuring color, music, and animation. At the beginning of a player's journey, Old Smoke Bailey gives some advice and explains what the player might encounter on the search.

The player must obtain food and fuel, fly a B-liner through storms, communicate in foreign cultures, and avoid the dangerous Mire Crabs. *(List Price: $39.95)*
Requires: Apple II Plus or IIe.
Spinnaker Software
215 First Street
Cambridge, MA 02142
(617) 868-4700

CIRCLE 564 ON READER SERVICE CARD

Sensible Speller IV
Sensible Speller IV is a spelling-verification program based on the Concise Edition of the *Random House Dictio-*

BASIC EXTENSION
for the Apple /// ™



If you program in Business Basic, you shouldn't be without it.

- *Change file types.*
- *Reset protection.*
- *High speed disk routines, 10 times faster than Basic, up to 30% savings in disk space.*
- *Access to any block on a disk.*
- *Array manipulation, insert - delete elements, move sections of arrays, search arrays.*
- *Character Set Editor, create or edit your own character sets.*
- *Disk Block Editor, view or edit any block on a disk.*
- *And more, all for only $95.*

FOXWARE PRODUCTS
2506 W. Midwest Dr., Taylorsville, UT 84118
(801) 364-0394
Apple /// is a registered trademark of Apple Computer, Inc.

CIRCLE 292 ON READER SERVICE CARD

BOOK KEEPER II
One of the most Versatile and user Friendly Personal bookkeeping systems on the market Today for Apple!! It is designed for PERSONAL OR SMALL BUSINESS USE.
ONLY $99.50

IT IS A BOOKKEEPER
- Up to 300 user Defined General Ledger Accounts and Description
- Process 1000 Entries per data Diskette
- Maintain Monthly and Year To Date Totals
- Batch process 200 Entries at a Time
- UNLIMITED BACK DATING
- UNLIMITED ACCOUNT RETRIEVAL AND CHANGING
- UNLIMITED MONTHLY ENTRIES
- Use it as a SINGLE or DOUBLE entry Bookkeeper
- Add or Subtract to all Ledger Accounts

IT IS A CHECK WRITER
- Permanently store 300 Payable Vendors with FULL ADDRESS and a 30 char. identification line
- Batch process 100 checks in MINUTES
- Write Checks up to $99,999.00
- Uses LOW COST CHECK with window envelopes
- Process a check for a single amount or up to 10 single entried with discounts
- MAINTAIN UP TO 10 CHECK BOOK BALANCES
- UNLIMITED LEDGER ACCOUNT distribution of check Amount
- Complete Utility programs to Alter or Change all data files
- All reports printed on standard 9½ x 11 paper
- 24 Hour User Hot Line

Mark / Donn Assoc.
Box 1589
Marietta, Georgia 30061
(404) 422-8169

MONEY BACK GUARANTEE
VISA OR MASTER CHARGE
DEALER INQUIRIES INVITED

APPLE IS A TRADEMARK OF APPLE COMPUTER, INC.

CIRCLE 153 ON READER SERVICE CARD

nary. When used with word-processing files, the Sensible Speller IV displays suspect words in context and allows immediate correction of any misspelled words. The program features extensive dictionary-searching capabilities and automatic suggestion of correct spelling for misspelled words.

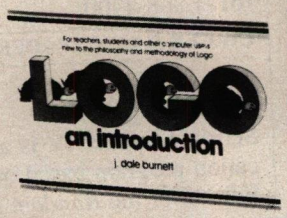
The improved version is for use with Apple DOS word processors, while each Sensible Speller package includes a version for use with Apple CP/M and Apple Pascal. Two disk drives are required to add or remove words from the supplied dictionary disks. *(List Price: $125)*

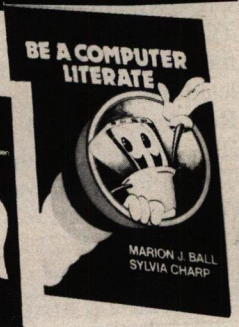
Sensible Software, Inc.
6619 Perham Drive
West Bloomfield, MI 48033
(313) 399-8877

CIRCLE 565 ON READER SERVICE CARD

COMPUTER BOOKS FOR YOUNG READERS

Help your children learn computer literacy the easy way!





Logo: An Introduction

By J. Dale Burnett

A beginner's guide to the popular language that teaches computer literacy. Helps novices create geometric shapes, curves, learn about programming, math, and more. Written in an open-ended style for both teachers and students. 11″ x 8½″, softcover, illustrated. $7.95 ($1.50). **#12L.**

Computers for Kids

By Sally Greenwood Larsen

Written for the elementary-age child, this easy-to-read book tells how to do calculations and graphics, save and load programs, write flow charts and use BASIC. Includes section for parents. 8½″ x 11″, softcover, illustrated. SPECIFY EDITION: Apple® $5.95 ($1), **#12G**; Atari® $5.95 ($1), **#12J**; IBM-PC® $5.95 ($1), **#12K**; Sinclair or Timex Sinclair $5.95 ($1), **#12S**; TRS-80® $5.95 ($1), **#12H**; Commodore VIC®-20 $5.95 ($1). **#12V.**

Be a Computer Literate

By Marion J. Ball and Sylvia Charp
Illustrated by Jonathan Byrd

Explains in simple terms how and why a computer functions. Illustrations, diagrams and photos make each concept clear without oversimplifying. This book offers a good overview of computers, with emphasis on larger systems. 8½″ x 11″, softcover, illustrated. $6.95 ($1.50). **#6H.**

Registered Trademarks: Apple: *Apple Computer, Inc.*; Atari: *Atari, Inc.*; IBM-PC: *International Business Machines*; TRS-80: *Radio Shack Div. of Tandy Corp.*; VIC: *Commodore Business Machines.*

For faster service,
PHONE TOLL FREE:
800-631-8112 (In NJ only: 201-540-0445)

Also available at your local bookstore or computer store.

CREATIVE COMPUTING PRESS
Dept. NF4H, 39 East Hanover Avenue
Morris Plains, NJ 07950

Please send books listed below:

Book No.	Qty.	Title	Price Each	(P&H) Each	Total Price
		CA, NJ and NY State residents add applicable sales tax			
			TOTAL AMOUNT		

Postage and handling charges appear in parentheses ( ) next to price of book.

☐ **PAYMENT ENCLOSED $**_____ Outside USA add $3.00 per order.

☐ **CHARGE MY:**
(Charge and phone orders $10 minimum.)
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Signature_____

Mr./Mrs./Ms._____
(please print full name)

Address_____ Apt._____

City_____

State/Zip_____

☐ Send me a FREE *Creative Computing* Catalog.

Apple-IBM Connection

This new version of the Apple-IBM Connection program supports the Apple IIe and additional communications cards for the Apple II family. The program enables transfer of data files back and forth between the Apple II family and the IBM Personal Computer or IBM PC-XT. It is now compatible with the Apple Super Serial Card and the CCS 7710 card from California Computer Systems. It continues to support the DC Hayes Micro-modem II and the CPS Multi-Function Card from Mountain Computer.

The connection allows transference of VisiCalc models, WordStar and any ASCII files. *(List Price: $250)*

Alpha Software Corporation
12 New England
Executive Park
Burlington, Ma 01803
(617) 229-2924

CIRCLE 566 ON READER SERVICE CARD

Graph 'N' Calc

A business-graphics generator and statistical-analysis program, Graph 'N' Calc is menu-driven and includes a set of commonly used statistical and financial calculations. It produces stacked and side-by-side bar, line, and pie charts. *(List Price: $199)*

Requires: Apple III; 256K.
Desktop Computer Software
Building 29, Suite 303
303 Potrero Street
Santa Cruz, CA 95060
(408) 458-9095

CIRCLE 567 ON READER SERVICE CARD

Lazer Maze

Lazer Maze is an adventure game set in the twenty-fourth century. In this future time, warfare is obsolete, and disputes are settled in the Arena of Final Reconciliation in one-on-one com-

WRITE YOUR OWN APPLE GAMES

Includes 40 exciting pre-programmed games to get you started!

Write Your Own Apple Games is your ticket to thousands of hours of solid game fun.

But it's more than just a game book.

While you're enjoying more than 40 exciting new programs, you'll be learning—quickly and easily—the most advanced techniques of computer game design.

In ***Write Your Own Apple Games,*** Stuart Anstis explains each game to you in logical, step-by-step subroutines. You'll see crucial game graphics exactly as they should appear on your screen.

Then you'll learn how to rearrange the basic subroutines to create countless game variations.

If you know BASIC, you're ready to learn state-of-the-art game techniques, including how to:

- Create smooth, flicker-free screen movement
- Generate flashing "neon-sign" graphics
- Keep game scores
- Use random numbers in game design—and make your computer come alive as an opponent
- Zero in on random time delays—a challenge to even the most sophisticated arcade player

And much more.

Write Your Own Apple Games gives you all the skills you need to start designing your own original computer games for fun—and profit!

And because writing your own games gives you greater control of your Apple's numerical and graphic capabilities, you'll be opening the door to fantastic new possibilities for using your computer.

Write Your Own Apple Games should sell for over $1,000—the cost of 40 pre-packaged games.

But you can get ***Write Your Own Apple Games*** for only $12.95. That's less than 32 cents a game—and every game you write yourself is virtually free!

Start having some serious fun with your Apple computer. Send for your copy of ***Write Your Own Apple Games*** today.

MAIL TODAY TO:
CREATIVE COMPUTING PRESS
Dept. NF6H
39 East Hanover Avenue
Morris Plains, N.J. 07950

Please send me _____ copies of ***Write Your Own Apple Games*** for only $12.95 each, plus $2.00 shipping & handling per book. #2W.

Total amount $_____.

☐ **Payment Enclosed.** (CA, NJ and NY State residents please add applicable sales tax).

☐ **CHARGE MY:** ☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Signature_____

Name_____

Address_____ (Please print)

City_____ State_____ Zip_____

*Outside the U.S.A. add $3 for shipping and handling.

☐ Check here to receive FREE catalog of computing books, magazines and guides.

For faster service, **PHONE TOLL FREE: 800-631-8112**
(In NJ only: 201-540-0445)

Also available in your local bookstore or computer store.

New Apple Portfolio Management System!

How to Invest for Better Returns.

Turn your Apple into a powerful investing tool.

Now you can improve your stock investments and make more money. . . with Micro PMS.

Share virtually the same vast information, analysis and expert advice enjoyed by major corporate investors right on your Apple II+ or IIe at a fraction of the cost.

Here's how simple and comprehensive Micro PMS is . . .

ADVANTAGE #1: Accurate, Timely Portfolio Records.

"How am I doing?"

First, you can set up your portfolio, enter transactions and print current appraisals. Then track and analyze your stocks. Even graph trends. Stocks are updated monthly or daily (optional).

ADVANTAGE #2: 50 Ways to Evaluate Stocks.

"How good is this stock?"

You can display and graphically compare any of 50 characteristics of your portfolio stocks, including price histories, growth projections, earnings data and even risk measurement and quality ratings.

ADVANTAGE #3: Rate your stocks against your objectives.

"Should I own these stocks?"

Give Micro PMS your investment objectives—income, growth or an aggressive portfolio. Micro PMS then tells you which of your holdings actually match those goals.

ADVANTAGE #4: Discover every stock that suits you.

"Where else can I invest?"

Next, Micro PMS will find every stock from its 1500-stock database which matches your investment criteria. For example, locate every stock with high yield, low P/E, fast growth *and* low risk.

ADVANTAGE #5: Solid Buy and Sell Advice.

"Now, what to buy? Sell?"

You're even told specific stocks to buy and sell to most closely match your objectives. That way you can make better, more profitable choices which align with your goals.

ADVANTAGE #6: Project Decision Implications.

"What if...?"

Finally, project results of potential investment decisions BEFORE you make them. Using sample portfolios, you can evaluate the potential impact of any transaction you're considering.

SEND FOR INFORMATION TODAY

For complete details, and the very low cost, return the coupon today. **Or, call 800-468-8324.** (In Mass. 617-722-7939.)

☐ **YES! Please tell me more about turning my Apple into a powerful investment tool with Micro PMS.**

Mail today to: Boston Safe Deposit and Trust Company
The Boston Company Micro PMS Group Dept. A
One Boston Place, Boston, MA 02106

Name _____ Phone _____
Address _____
City _____ State _____ Zip _____

The Boston Company
A subsidiary of Shearson/American Express, Inc.

Apple is a registered trademark of Apple Computer Inc. © 1983 The Boston Company

CIRCLE 170 ON READER SERVICE CARD

petition. In this mirrored arena, the players must fire laser guns and predict where the beam will exit after reflecting off the walls. *(List Price: $29.95)*

Requires: Apple Plus.

Avant Garde Creations
P.O. Box 30160
Eugene, OR 97403
(503) 345-3043

CIRCLE 568 ON READER SERVICE CARD

AmortZ

A software package for mortgage lenders to prepare disclosure statements, AmortZ was specifically designed for Regulation A disclosure requirements, but also handles the following mortgages: fixed, balloon, GPM/ARM, EOM, GEM, zero interest, interest only, RPM, and more. It prepares others, including FHA single-premium insurance, effective Sept. 1, 1983.

The package has two versions: The first offers unlimited disclosure production, and the other version permits a specified number prepared at a price established in advance. *(List Price: first version, $1695; second version, $995)*

Requires: Apple II, IIe, or III; 48K; at least one disk drive and a dot-matrix printer.

Symba Marketing, Inc.
P.O. Box 222092
Dallas, TX 75222
(214) 526-3292
(800) 527-5341 outside Texas only

CIRCLE 569 ON READER SERVICE CARD

Graphics Magician

Graphics Magician is an updated version of the Apple Graphics Magician with text routines added to the picture editor. It has three animation editors that design shapes and their paths and assemble animations with up to 32 independent objects. Because the language-animation file can be added to BASIC or machine-language programs, programmers have complete control over paths, shapes, locations, and collision detection.

The shape editor can flip and rotate shapes, the path editor can draw paths on background graphics, and the animation editor is easier to use. The version for paddles and joystick and the Apple Graphics tablet are now on one disk. *(List Price: $59.95)*

Requires: Apple II, II Plus, or IIe; 48K.

Penguin Software
830 4th Avenue
Geneva, IL 60134
(312) 232-1984

CIRCLE 570 ON READER SERVICE CARD

EZ Church Membership System

A computer-based membership system for small and medium-sized churches,

zardax

][+ or //e

And now for Apple ///

YOUR KEY TO PROFESSIONAL WORD PROCESSING

Powerful: All the standard goodies: find, replace, move, save/insert sections. Glossary function for quick entry of commonly used phrases. Form letter (mail merge) built in. File chaining for long documents. Standard text files link to spelling checkers and databases. Printer spooling -- print one chapter while you type the next -- using RAM card or //e Auxiliary Memory.

Reliable: Three years of sales and user support. No surprises. No "death in the night."

Options: ZIP-COMM communications package fits inside Zardax to send or receive text easily. $80.

Versatile: Over 40 printers and many interface cards supported. You can create or modify printer files if needed. Twelve][+ 80 column cards, plus //e text and Auxiliary Memory cards. Also works in 40 columns. Free and copyable Utilities disk available from dealers adds new devices and features as they become available.

Easy: Editing commands are easy to remember and teach. Two menus for disk operations and printing. Built-in print formatting commands so you don't have to mess with escape or control codes.

New for the Apple ///: More power and features at the same price -- $210. Text files up to 197K load from ProFile in under 11 seconds. Commands compatible with][+ and //e versions.

Just push our button - -

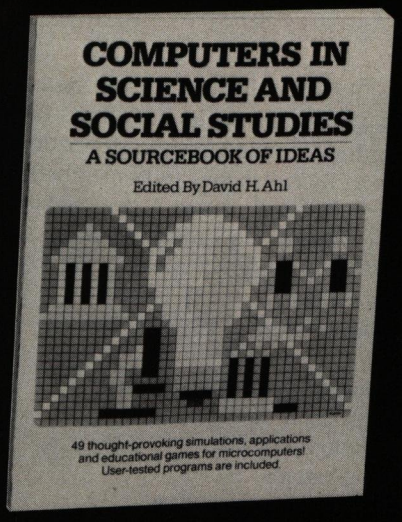
Dealer inquiries invited.

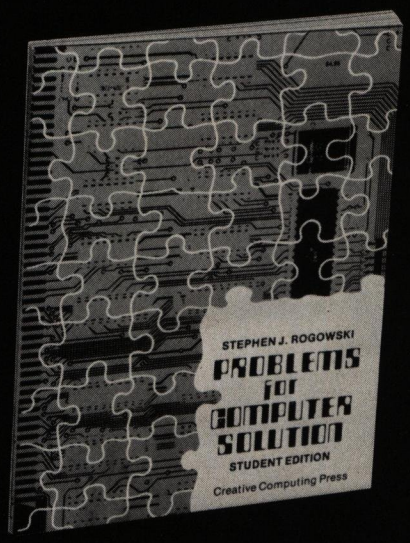
Apple][+, //e and ///, c. Apple Computer, Inc.
ZARDAX is a trademark of Computer Solutions, Pty., Australia.

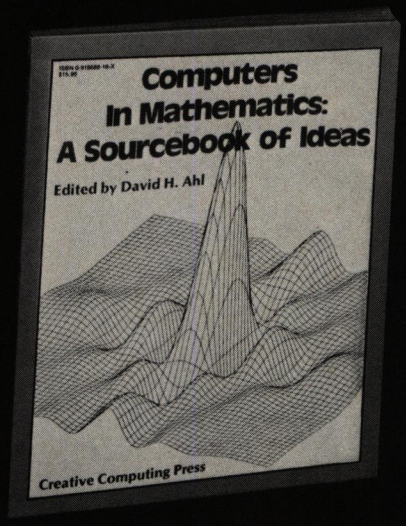
Action-Research Northwest
11442 Marine View Drive, SW.
Seattle, WA 98146
(206) 241-1645 Source: CL2542

CIRCLE 172 ON READER SERVICE CARD

For home or classroom







Use these three books for state-of-the-art learning material!

COMPUTERS IN SCIENCE AND SOCIAL STUDIES

Edited by David H. Ahl

Are you involved with one of the physical or social sciences? This new book brings together 40 science-oriented computer articles from the pages of *Creative Computing*.

Fields covered include Social Studies, Psychology, Chemistry, Biology, Physics, Health, Ecology, Astronomy, History, Economics, Geography, Medicine—even Interstellar Trade! You'll find games, brief tutorials and programs that bring together the many exciting uses of the computer in social studies and science!

8½" x 11", softcover.
$14.95 ($2.00) #9X

PROBLEMS FOR COMPUTER SOLUTION

By Stephen Rogowski

Here are 90 intriguing math and science problems—most consisting of several parts—that will provide hours of fascination and challenge. Each problem is clearly presented and thoroughly discussed, with references made to standard math texts. Problems cover eight areas: arithmetic...geometry...trigonometry...number theory...probability...statistics...calculus...science.

The Student Edition includes only the problems, while the Teacher's Edition contains problems, solutions, a complete listing and run in BASIC for each, and in-depth analyses explaining the algorithms and theory for each problem.

8½" x 11", softcover.
Student Edition $4.95 ($1.00) #9Z;
Teacher Edition $9.95 ($2.00) #9Y

COMPUTERS IN MATHEMATICS: A SOURCEBOOK OF IDEAS

Edited by David H. Ahl

Scores of ready-to-use, classroom-tested ideas in dozens of areas such as solving differential equations...trigonometric functions and Tchebychev approximations...computer simulations and problem-solving in probability...binary counting...regression analysis. Practice programs, art and graphing problems, program listings and sample runs are included, plus over 250 problems, puzzles and programming ideas.

8½" x 11", softcover, illustrated.
$15.95 ($2.00) #12D

For faster service, ***PHONE TOLL FREE: 800-631-8112*** (In NJ only: 201-540-0445)
Also available at your local bookstore or computer store.

CREATIVE COMPUTING PRESS · **Dept. NK6F** · **39 East Hanover Avenue** · **Morris Plains, NJ 07950**

Please send books listed below:

Book No.	Qty.	Title	Price Each	(P&H) Each	Total Price
		CA, NJ and NY State residents add applicable sales tax			
				TOTAL AMOUNT	

Postage and handling charges appear in parentheses ( ) next to price of book.

☐ PAYMENT ENCLOSED $_____ Outside USA add $3.00 per order.

☐ CHARGE MY: (Charge and phone orders $10 minimum.)
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Signature_____

Mr./Mrs./Ms._____
(please print full name)

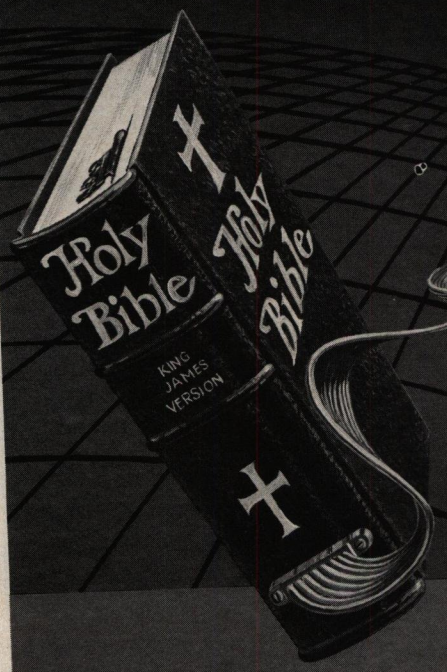
Address_____ Apt._____

City_____

State/Zip_____

☐ Send me a FREE *Creative Computing* Catalog.

New dimensions in Bible study.



THE WORD processor
the complete KJV Bible on disks $199.95 *

TOPICS
an index to over 200 Scripture subjects $49.95 *

* plus $3 postage/handling

Requires APPLE II +, IBM PC and compatibles, TRS80, CP/M 2.2 (Z-80), KAYPRO, OSBORNE, COMMODORE 64.

For information contact:
Bible Research Systems
P.O. Box 1389
Round Rock, TX 78680
(512) 835-7981

"Software for personal Bible study."

CIRCLE 162 ON READER SERVICE CARD

"BACK-UP" YOUR DISKS

ESSENTIAL DATA DUPLICATOR

The most powerful disk duplicator available for your Apple™ computer. EDD can "Back-Up" more protected Apple software.

Since EDD is almost totally automatic, no longer will you have to put up with changing parameters to duplicate most disks, although every parameter is fully documented in our extensive manual. We also are providing updated program parameter lists.

$79.95
CA residents add 6%

Runs on: Apple II, II plus IIe, or III (emulation mode with 1 or 1, 3.3 drives

- EDD rarely needs parameter changing
- Automatically finds the beginning of each track
- Accurately finds "Auto-Sync" bytes and their lengths
- Can copy ¼ tracks
- Plus many more features

TO ORDER OR FOR MORE INFO, CALL 707-257-2420
UTILICO SOFTWARE
3377 Solano Ave., Suite 352, Napa, CA 94558

US

CIRCLE 190 ON READER SERVICE CARD

PRODUCT NEWS

the EZ Church Membership System uses one central file that allows the recording of membership information on up to four diskettes (600 members on each diskette). It can accommodate two or more congregations at once.

The EZ Church Membership System is distributed in Microsoft BASIC object code and requires either an Apple II Plus or IIe with a Softcard from Microsoft. *(List Price: $289.95)*
Requires: Two disk drives, but will handle up to six.
EZ Systems, Inc.
214 Mockingbird Road
Nashville, TN 37205
(615) 269-6428

CIRCLE 571 ON READER SERVICE CARD

The Skeletal System
A collection of programs exploring the major parts of the skeletal structure, The Skeletal System is broken down into five parts: bones, major skeletal bones, joints, ligaments, and cartilage. A review test is also included. *(List Price: $72)*
Requires: Apple II, II Plus, or IIe, floppy disk or cassette.
Brainbank Inc.
220 Fifth Avenue
New York, NY 10001
(212) 686-6565

CIRCLE 572 ON READER SERVICE CARD

MISCELLANEOUS

The Scorpion
A small, sophisticated robot designed for computer hobbyists interested in artificial intelligence. The robot is completely software programmable with two 6522 interface chips providing 32 lines of I/O and four programmable timers, two of which can be event counters.

The Scorpion's creators have designed the robot to be able to see, make noises, and move along the ground in any direction at 99 different speeds. The Scorpion controls four motors, two of which are drive wheels, one speaker, two eyes, two ground tracks, and a two-axis optical scanner. It comes in a kit with detailed assembly instructions and requires 12

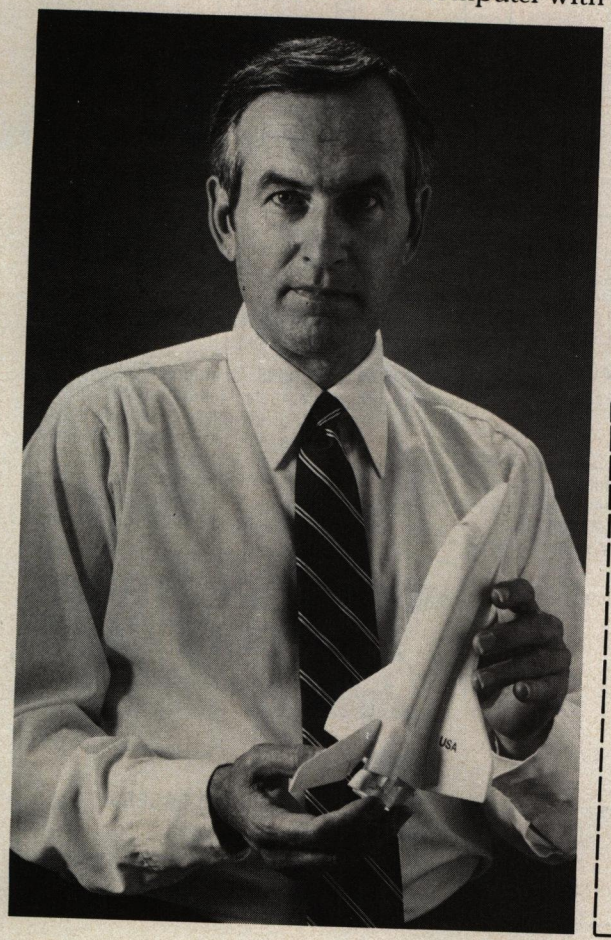
TRACK A SPACE SHUTTLE ON AN APPLE? YES. WITH MICROSPEED!

At the Jet Propulsion Laboratory in Pasadena, NASA scientists have discovered the power of MicroSPEED. Using this remarkable hardware/software system with an Apple II, they produced a continuous graphic display of the Columbia's position relative to the earth during the second Shuttle mission. This enabled the JPL team to accurately follow the spacecraft in *real time*, and to precisely control its powerful sensors at critical points along the flight path.
Surprised that such a demanding project is possible on the Apple? So were JPL's engineers, and many others who have discovered . . .

THE MICROSPEED DIFFERENCE This extraordinary Language System exploits the real potential of the microcomputer for the first time. The difference between MicroSPEED and other programming languages is that with MicroSPEED, there is virtually *no limit* to what you can achieve. It may well be the ultimate language for the Apple II, //e and /// (and the IBM Personal Computer). MicroSPEED literally combines the performance of a minicomputer with an exhaustive set of user-friendly capabilities: hardware math processing, fast hi-res graphics and text, turtle graphics, print formating, two text editors, unlimited data types, and incredible FORTH extensibility—all at speeds up to 100 times faster than Basic.

USER-FRIENDLY, EASY-TO-LEARN Starting with simple commands that are comfortable even for non-programmers, MicroSPEED extends and builds, allowing you to create your own tailored application languages. The capability of your computer will grow exponentially, as you work in an active partnership with the machine, exploring and developing new problem-solving facilities—creating, correcting, refining your increasingly powerful system.

DEMANDING JOBS AT LOW COST MicroSPEED has been put to the test in fields as diverse as medicine, the stock market, oceanography, and the arts. In even the most challenging applications, MicroSPEED users have been unanimous in their praise of the System and manual. Typical comments are:



". . . we are more than pleased with MicroSPEED . . . I can't imagine using BASIC on any future applications."
Roger Guevremont, National Research Council of Canada.

"I continue to marvel at its versatility and power."
Carl R. Schramm, USCG Base, Kodiak, Alaska.

"Great! . . . A joy to use."
Henry Harris, Mission Design Manager
Jet Propulsion Laboratory

"If you plan to use a personal computer for <u>any</u> demanding task, then we built MicroSPEED for <u>you</u>."
Sam Cottrell, President of Applied Analytics.

MicroSPEED requires the Apple Computer with single disk. MicroSPEED II includes 2 MHz math processor. MicroSPEED II + includes 4 MHz math processor.

Applied Analytics Incorporated
8235 Penn-Randall Place
Upper Marlboro, Maryland 20772 (301) 420-0700

Please send me:

_____MicroSPEED II, $395.00 _____160 Page Manual, $15.00
_____MicroSPEED II+, $495.00 _____Detailed Information

Name: _____
Company: _____
Address: _____
City_____ State_____ Zip_____ Phone No.( )_____

μSPEED™

APPLE IS A TRADEMARK OF APPLE COMPUTER, INC.

CIRCLE 261 ON READER SERVICE CARD

Apple II

CP/M

IBM PC

SPECTRUM

Professional Software Products

MATHEMATICS SERIES

The Series Includes These 4 Programs:

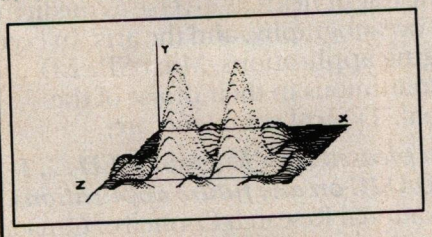
STATISTICAL ANALYSIS I: This menu driven program performs LINEAR REGRESSION analysis, determines the mean, standard deviation and plots the frequency distribution of user-supplied data sets.

NUMERICAL ANALYSIS: HI-RES 2-Dimensional plot of any function. Automatic scaling. At your option, the program will plot the function, plot the INTEGRAL, plot the DERIVATIVE, determine the ROOTS, MAXIMA, MINIMA and INTEGRAL VALUE.

MATRIX: A general purpose, menu driven program for determining the INVERSE and DETERMINANT of any matrix, as well as the SOLUTION to any set of SIMULTANEOUS LINEAR EQUATIONS.

3-D SURFACE PLOTTER: Explore the ELEGANCE and BEAUTY of MATHEMATICS by creating HI-RES PLOTS of 3-dimensional surfaces from any 3-variable equations. Hidden line or transparent plotting.

For APPLE II (48K) and IBM PC (64K) $50.00



BUSINESS SOFTWARE SERIES

Both Programs $250.00

A user-friendly yet comprehensive double-entry accounting system employing screen-oriented data input forms, extensive error-trapping, data validation and special routines for high speed operation. The series includes these two modules:

GENERAL LEDGER: A complete accounting system with these features:

- Up to 500 accounts and 500 transactions per month.
- Interactive on-screen transaction journal.
- Produces these reports:
  - Transactions Journal
  - Account Ledgers
  - Income Statement
  - Balance Sheet
  - Account Listings

For APPLE II and IBM PC $150.00

ACCOUNTS RECEIVABLE

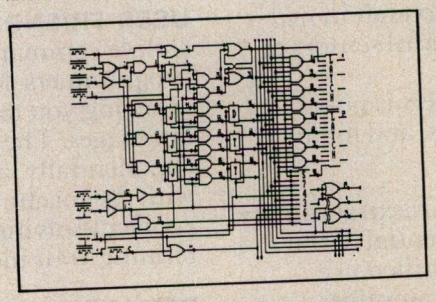
A flexible system with these features

- Up to 500 accounts and up to 500 invoices per diskette.
- Prints invoices, customer statements & address labels.
- Interfaces to General Ledger.
- Interactive screen-based invoice work sheet.
- Produces these reports
  - Aged Receivables
  - Sales Analysis
  - Account Listings
  - Customer Balances

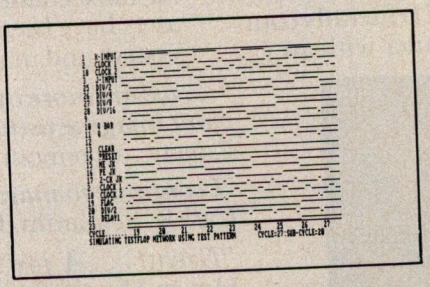
For APPLE II and IBM PC .... (2 DRIVES) .. $150.00

MICRO-LOGIC

An interactive graphics program for designing and simulating digital logic systems. Using the built-in graphics module, the user creates a logic diagram consisting of AND, OR, NAND, NOR, EX-OR, D, T, JK FLIP FLOP and powerful 16 pin user-defined MACRO functions. A typical page of a logic diagram looks like this:



The system provides on-screen editors for NETWORKS/MACROS DATA CHANNELS, CLOCK WAVEFORMS and GATES. GATE attributes include DELAY, TRUTH TABLE, NAME and I/O clocking.



The system is available for Apple II and IBM PC computers. A non-graphics version is available for CP/M 2.2 It uses the network editor to create netlists and text printer plots to display simulation results. All versions require 2- 5 1/4" disk drives.

For APPLE II, IBM PC (192K) and CP/M (70K) $450.00
MANUAL & DEMO DISKETTE $50.00

PERSONAL FINANCE MASTER

The premier personal and small business financial system. Covering all types of accounts including check registers, savings, money market, loan, credit card and other asset or liability accounts, the system has these features:

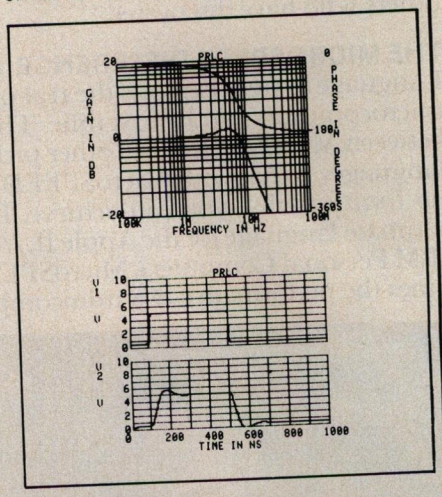
- Handles 25 Asset/Liability Accounts
- Monthly Transaction Reports
- Budgets Income & Expense
- Reconciles to Bank Statements
- Prints Checks & Mailing Labels
- Automatic Year-End Rollover
- Prepares a Net Worth Reports
- Searches for Transactions
- Handles Split Transactions
- User-Friendly Data Entry Forms
- Fast Machine Language Routines
- Extensive Error Trapping
- HI-RES Expense/Income Plots

For APPLE II and IBM PC $75.00

MICRO-CAP

Microcomputer Circuit Analysis Program

Tired of trial & error circuit design? Analyze and debug your designs before you build them. With MICRO-CAP you simply sketch your circuit diagram on the CRT screen and run an AC, DC or TRANSIENT ANALYSIS. Your circuit may consist of RESISTORS, CAPACITORS, INDUCTORS, DIODES, BATTERIES, BIPOLAR or MOS TRANSISTORS, OPAMPS TRANSFORMERS, and SINSUSOIDAL or USER-DEFINED TIME DEPENDENT VOLTAGE SOURCES. MICRO-CAP can analyze any such network containing up to 40 separate nodes. Includes a user controlled MACRO library for modelling complex components such as OPAMPS and Transistors.



For APPLE II and IBM PC computers. A non-graphics version using an on-screen editor to enter networks and text printer plots to display simulation results is available for CP/M (2.2- 5 1/4" SSSD) systems. Requires 2 disk drives.

For APPLE II, IBM PC (192K) and CP/M (70K) $475.00
MANUAL and DEMO DISKETTE $50.00

ORDERING INSTRUCTIONS: All programs are supplied on disk and run on Apple II (64K) or IBM PC (128K) with a single disk drive unless otherwise noted. Detailed instructions included. Orders are shipped within 5 days. Card users include card number. Add $2.50 postage and handling with each order. California residents add 6 1/2% sales tax. Foreign orders add $5.00 postage and handling per product.

SPECTRUM SOFTWARE

690 W. Fremont Ave., Suite F
Sunnyvale, CA 94087

master charge

VISA

FOR PHONE ORDERS:
(408) 738-4387
DEALER INQUIRIES INVITED.

PRODUCT NEWS

V DC for operation.

The Scorpion follows instructions and answers questions from the host computer. The computer on board, which contains a 6502 microprocessor, 8K of EPROM, and 2K of RAM (expandable to a 64K system), translates the host computer's instructions into action. The 130-page manual accompanying the kit contains detailed information about the 30 instructions in the special Scorpion language.

The robot's two-axis optical scanner can recognize patterns over a 300° scan in both vertical and horizontal planes, with a resolution of 1.5° of scan per step. You can display the visual patterns on the screen, and can program the Scorpion to announce the recognition of designated objects with a preset tone or other sounds. (*List Price: $660*)

Requires: 64K; Apple II, II Plus, or IIe; one disk drive.

Rhino Robots, Inc.
P.O. Box 4010
Champaign, IL 61820
(217) 352-8485

CIRCLE 573 ON READER SERVICE CARD

Calling Four

A game-port expander designed to aid users by eliminating the need to constantly remove the computer cover when switching controllers.

Calling Four allows the computer to accept such diverse controls as a mouse and trackball simultaneously and enables programmers to utilize up to four different controls within the same program.

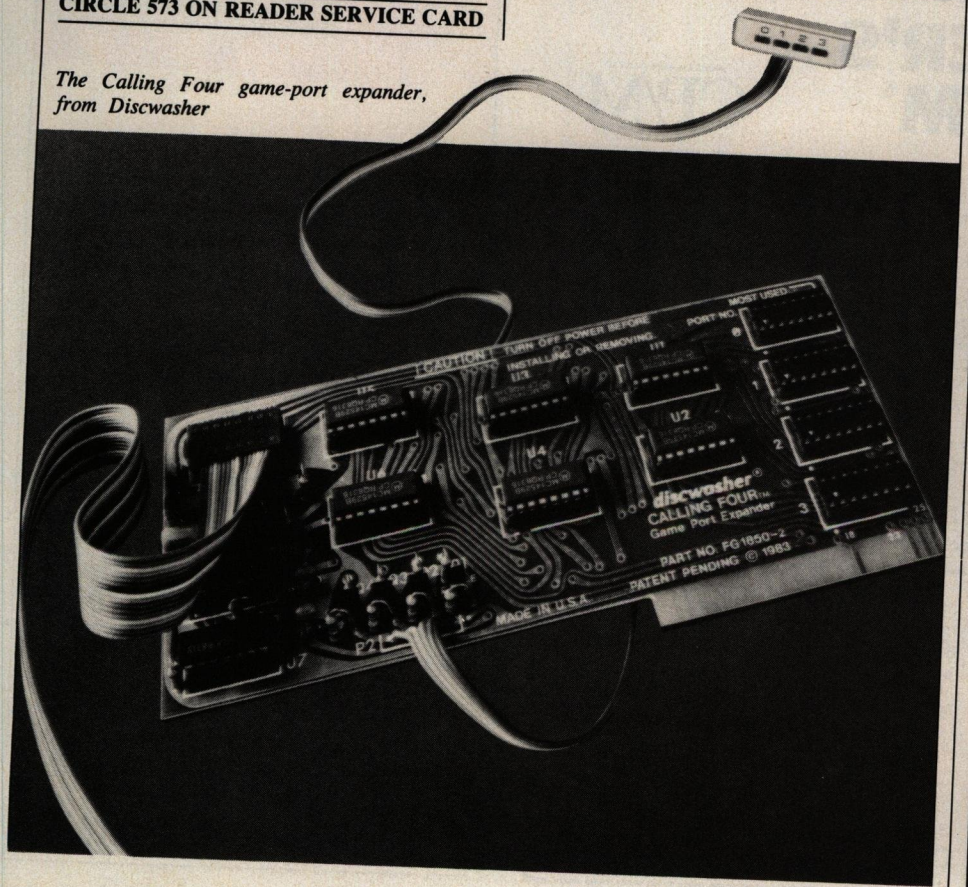
You can install the Calling Four game-port expander via one of the computer's expansion slots. You can select each control through keyboard entry or software codes. The peripheral also features an LED display indicating which of the four ports is in use and a demonstration disk offering two programs that illustrate all Calling Four's features. (*List Price: $69.95*)

Requires: Apple II, II Plus, or IIe.

Discwasher
1407 North Providence Road
Columbia, MO 65205
(314) 449-0941

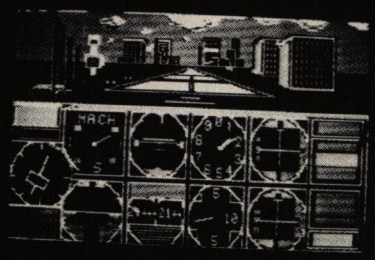
CIRCLE 574 ON READER SERVICE CARD

The Calling Four game-port expander, from Discwasher



APPLE MART

PROGRAMMERS FLIGHT SIMULATOR
Apple II Plus DOS 3.3 48K



This total IFR System disk features gobs of menu selectable flight programs each with breath taking realistic picture graphics, moving scenery, airport approaches, holding patterns and much much more.

$50.00 At your computer Store or direct from
Visa Mastercard

Programmers Software
Box 199
Cabot, Arkansas 72023
(501) 843-2988

CIRCLE 799 ON READER SERVICE CARD

BIG SAVINGS
FOR
APPLE OWNERS

Z 80CARD	$80
80 COLUMN CARD	$90
128 K RAM DISK	$225
GREEN MONITORS	from $89
AMBER MONITORS	from $120
COLOR MONITORS	from $120
PRINTERS	from $295
DISK DRIVES	from $220
	from $199

MORE!
For free price list or to order call or write:

THRIFTY BITS
P.O. Box 243 Belle Mead, N.J. 08502
(201) 369-7972

R.I.S.T. Inc. ANNOUNCES
SPEECH SYNTHESIZER
ORDER NOW **SALE** ORDER NOW
$59.95 plus $4.00 sh/hd
ACT NOW. Receive
Phrase Finder Program
Speech Synthesis Manual
FREE
TRS80 Models I, III
Apple II, II+
ZX80/81 TS1000
Com 64, VIC 20
HEAR THE POWER...
The Parrot R.I.S.T. Inc.
Regularly $89.95
Now Only $59.95
Complete or Starter Kits Available
10 Day Money Back Guarantee
Send check or M.O. COD add $1.50 to R.I.S.T. Inc.
Dept. GZ 81 P.O. Box 499 Ft. Hamilton Station
Brooklyn, NY 11209 212-259-4934
N.Y.S. RESIDENTS ADD 8 1/4% TAX

VISICALC* FORMATTING AIDS 4.5

A B C

1 Print VisiCalc models with variable-width columns!
2 Print selected rows and columns!
3 Insert commas in large numbers!
4 Replace 0/0.00 with -0- or other options!
5 Add local or global $ signs!
6 Add spaces between columns!
7 Add centered, multi-line report headers!
8 Print multiple copies - automatically!
9 Print or display formulas etc. arranged in columns!
10 Much more!
11
12 VisiCalc Formatting Aids is easy to learn and use, with plain English promptings. For added flexibility and professional-looking reports, buy your copy today!
13 Apple II + /IIe, or Apple ///. 54.95 (+1.00 postage).

DATA SECURITY CONCEPTS

VISA® MasterCard

P.O. Box 31044, Des Peres, MO 63131 (314) 965-5044

*VisiCalc is a trademark of VisiCorp

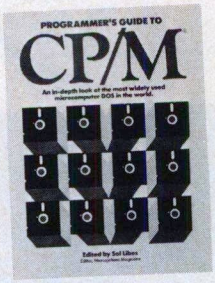
Apple is a trademark of Apple Computer Co.

CIRCLE 185 ON READER SERVICE CARD

An outstanding new book from *Microsystems* Press

PROGRAMMER'S GUIDE TO CP/M®

Edited by Sol Libes



This authoritative volume of reprints from *Microsystems* magazine is a must for the programmer writing software for CP/M or the individual installing CP/M on non-configured systems. *Programmer's Guide to CP/M* includes sections on: CP/M structure and format • The CP/M connection • Interfacing CP/M to operating systems. File operations. CP/M on North Star systems • CP/M software reviews • CP/M enhancements • CP/M directories • CP/M applications programs • CP/M assemblers • Evaluations of MODCOM, COMMX, MCALL, OSI and other software • Business and accounting programs • Compiler BASIC • Data base systems • Debuggers/Disassembler • Editors, formatters and word processors • Encryption. The *Guide* also offers material on interpreters, languages, utilities, sort programs and much more. CP/M is the most widely used, most commonly implemented operating system in the world. This book provides a focused look at its unique and practical features.

8½" x 11", softcover, $12.95.

CP/M is a registered trademark of Digital Research, Inc.

For faster service, PHONE TOLL FREE: 800-631-8112 (In NJ only: 201-540-0445)

Also available at your local bookstore or computer store.

MICROSYSTEMS PRESS
Dept. NJ3C , 39 East Hanover Avenue
Morris Plains, NJ 07950

Please send me _____ *Programmer's Guide to CP/M* at $12.95* plus $2.00 postage and handling each. Outside USA add $3.00 per order. #14C

☐ **PAYMENT ENCLOSED $**_____ *Residents of CA, NJ and NY State add applicable sales tax.

☐ **CHARGE MY:**
☐ American Express
☐ MasterCard ☐ Visa

Card No._____ Exp. Date____

Signature_____

Mr.
Mrs.
Ms._____
(please print full name)

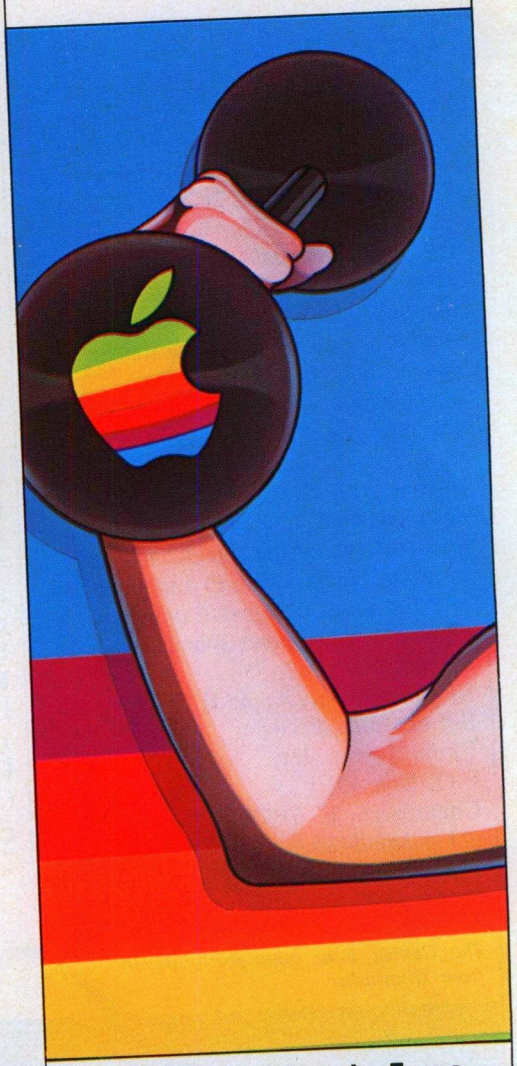
Address_____ Apt.____

City_____

State/Zip_____

☐ Send me a FREE *Creative Computing* Catalog.

COMING UP



High-Tech Muscle Tone

EXTENDING YOUR APPLE:
Graphics Tablets
Music Synthesis
Voice Input

Font Generators on the Apple III

Beagle BASIC Review

Graphic Solution Review

Advanced uses of VisiCalc

dBASE II Tutorial, Part IV

Zaxxon Review

Golden's Apples

APPLE DIRECTORY

RATES AND INFORMATION

Listings are grouped by category and consist of a bold lead line (23 characters maximum), 7 lines of ad copy (45 characters per line), plus 4 lines of company name, address and telephone number.

Listings are available only on a 3 issue basis at $100. per issue ($300. total). Copy will have a set format and remain the same for all 3 months. Enhance the appearance of your ad by including your Logo at an additional cost of $75. per issue ($225. minimum extra charge). Pre-payment is required by check, money order, or American Express, Diners Club, MasterCard, Visa credit cards. Closing Date 1st of 2nd month preceding cover date.

Send copy and remittance to A+, APPLE DIRECTORY, 12th FLOOR, 1 PARK AVENUE, NEW YORK, NY 10016. Call (212) 725-4215 for additional information or assistance.

▶HARDWARE/DISK DRIVES

RELIABLE COMPATIBLE DRIVES

Save on MITAC Disk Drives. Mitac's 5¼" 10MB Winchester Disk Drive is the business partner you need. It enlarges your storage capacity and speeds your data inquiry response. For top performance and quality—the AD-100A is only $1395. Floppy disk drive AD-1 $189. Just plug in and run. Visa/MC.
OZTECH
1400 Coleman Ave.
Suite E25
Santa Clara, CA 95050
(800) 222-6677
In California:
(408) 980-9987

▶HARDWARE/DISKETTES

5¼" WABASH DISKETTES

Top Quality—Six year warranty by Wabash.... SSSD with hub ring $17.90 (10), $160.00 (100)... SSDD with hub ring $20.50 (10), $190.00 (100). INDIVIDUALLY CERTIFIED 100% ERROR-FREE. Shipping—$2. (90 or less) or $5. per case of 100 diskettes. Illinois residents add 6% tax. VISA, Master Card, Money Order, Check. COD add $3.
DIGITAL IMAGES
1133 Tower Rd.
Schaumburg, IL 60195
(800) 222-1248
(312) 882-8315

▶HARDWARE/MONITORS

RGB COLOR BOARD

FOR APPLE IIe, II+, Franklin Ace 1000. Color Master Model VCB8, a new video board that provides RGB video signals for crisp, vivid display of color graphics & text with greatly enhanced resolution & color quality. Plugs in to slot 7 & can be used with Apple's 80 column board with extra memory. Text can be displayed in any one of 8 colors, software selectable. $139.
TELEMAX, INC.
Box 339
Warrington, PA 18976
215-343-3000

▶HARDWARE/PERIPHERALS

MODEM SYSTEM FOR APPLE II

The "MULTI-MODEM IIe" from Multi-Tech Systems provides Apple II, II+ and IIe users with 300 bps dial-up communications. Modem is single pc card that plugs into Apple expansion slot. Includes complete software on diskette. DOS, CP/M, Hayes compatible. Autodial, auto-answ, logon, menu, file transfer, number directory.

MULTI-TECH SYSTEMS

MULTI-TECH SYSTEMS INC.
82 Second Avenue S.E.
New Brighton, Minnesota 55112
(612) 631-3550 * TWX (910) 563-3610

▶PUBLICATIONS

MINUTE MANUALS

Apple Writer IIe	$7.95
DB Master	12.95
Apple Writer II+	7.95

Provides easy step-by-step instructions for the basic operating prcedures that get you working at the highest possible skill level in the shortest amount of time. Free info.
MINUTEWARE
P.O. BOX 2392
COLUMBIA, MD 21045
(301) 995-1166

▶RETAILERS/NEW YORK

A WORLD OF COMPUTERS A WORLD OF DIFFERENCE

SPECIAL OFFER $150 Kensington system saver plus format II word processor. Special prices on all apple peripherals. Call or write:
A WORLD OF COMPUTERS
519 Boston Post Road
Port Chester, NY 10573
(914) 937-6845

▶SOFTWARE/ACCOUNTING

SYSTEM II EX-TURNINGPOINT

The Turningpoint series is a fully integrated business accounting system containing G/L, inventory, receivables, payables and payroll. A data base for general office use is also included in the full package. Job costing is available as an option. SYSTEMS II EX was rated as "excellent" in performance by InfoWorld. Full system $1,595.
WESTWARE Inc.
2455 Southwest 4th Avenue
Ontario, OR 79714
(503) 881-1477

▶SOFTWARE/BUSINESS

YOUR PRINTERS BEST FRIEND

"Print Master" for 48K Apple. Prints business checks, mailing labels, mailing lists, sorts lists, and addresses envelopes. All from file data. Has the powerful sorting features of the expensive programs. Completely menu driven and very user friendly. All on one copyable disk. Only $29.95. Write for free info.
Soft-Byte
P.O. Box 5701, Forest Park
Dayton, Ohio 45405

▶SOFTWARE/EDUCATIONAL

FREE CATALOG AVAILABLE

The Minnesota Educational Computing Consortium (MECC) catalog contains computer literacy, training materials, and over 160 courseware diskettes for the Apple II, Atari 400/800, IBM PC, Commodore Pet, and Radio Shack III/4 and Color Computer. The MECC catalog is free upon request.
MINNESOTA EDUCATIONAL COMPUTING CONSORTIUM
3490 Lexington Avenue North
St. Paul, Minnesota 55112
(612) 481-3500

MULTI-LINGUAL SOFTWARE

French and Multi-Lingual Software for the Apple II+ or IIe. Free Catalogue. Newest release-Multi Lingual Questionnaire Generator; THE GREAT CREATOR can be used in 17 different languages to create & operate multiple-choice and fill in the blank questionnaires. No EXTRA HARDWARE REQUIRED. $399.95. Demo available for $5.00.
THE PROFESSOR
P.O. Box 301B
Swanton, VT 05488
(514) 747-9130

APPLE DIRECTORY

VOCABULARY PROMPTER

For use in Home/School/Industry. Augments the learning of vocabulary and/or course material through the randomized presentation of user-created (word/sentence/question) prompt files. Study/Test options offer all prompts in file. One Disk Drive (DOS 3.3) 48K, printer optional. $32.45 (Inc. SHIP/HNDLG).
JAGDSTAFFEL SOFTWARE
645 Brenda Lee Drive
San Jose, CA 95123
(408) 578-1643

KINDER KONCEPTS

30 PROGRAMS AVAILABLE FOR ages 4–7. Reading readiness, colors, shapes, discrimination, perception, math concepts, etc. A complete KGN year in one series. Send for $10.00 demo disk. 3 reading disks and 3 math disks at $39.50 or complete set for only $175.00. For Apple II+ or IIe. Back-up disks included.
MIDWEST SOFTWARE
Box 214
Farmingtron, MI 48024
(313) 477-0897

BEGINNING BASIC

INTERACTIVE TUTORIAL IN Applesoft BASIC. BEGINNING BASIC quickly and easily gets the new student programming the Apple (or compatible) computer with Applesoft. This tutorial covers everything from screen formatting to looping techniques, arrays, and graphics. An online index of terms is included. $34.95

APPLIED MICROSYSTEMS, INC.
P.O. BOX 832
Rosewell, GA 30077
(404) 475-0832

TEACHERS!

THE ASSISTANT TEACHER Handles almost every aspect of test preparation, administration, grading, analysis, curving, averaging and reporting. Includes word processor, optical scanner support, much more! Extremely flexible and easy to use. Satisfaction guaranteed. $99.50; Manual $10.00.
OVERDRIVE COMPUTER CORPORATION
1562 Morrings, Dr.
Reston, VA 22090
(703) 471-0919

SOFTWARE: GENERAL

FREE SOFTWARE CATALOG FROM "DYNACOMP."

Write for 100+ page catalog listing hundreds of programs for education, games, business and engineering. Diskettes $19.95/ten in plastic storage box. (plus $2.00 for s/h).
Dynacomp
1427 Monroe Ave.
Rochester, N.Y. 14618
(716) 442-8960

AIR NAV WORKSHOP

ANW, incorporates two training aids all about VOR's and NDB/ADF's and a fully-customizable real-time navigation simulator. Simulate your own area. Customize navaid type, number, range, location, 3-letter ID's, mag. variation. Auto-flight path replay, adjustable winds, etc. II &IIe, 48K, DOS 3.3. $40. Check, MC/VISA, UPS-COD.
SPACE-TIME ASSOCIATES
20-39 Country Club Drive
Manchester, NH 03102
(603) 625-1094

LOCATOR-XREF-INVENTORY

Do a fast search and sorted output for your technical journals & reference library, your seldom used items, and inventory your valuables. Design your own titles for your needs. $59.95, sixty day guarantee. 6.5% tax for California residences.
8TH DIMENSION ENTERPRISES
P.O. Box 62366
Sunnyvale, CA 94088-2366
Answering machine—408/972-0469

GENEALOGY/FAMILY ROOTS

Family roots for your genealogy. Store standard and custom info.—does group and individual sheets, four types of charts, various indices, general searches, and much more. No limits. Very comprehensive. Satisfaction guaranteed. Price $188.50 including postage.
QUINSEPT, Inc.
P.O. Box 216
Lexington, MA 02173
(617) 862-0404

SOFTWARE/ GRAPHICS

MIX LO-RES, HI-RES & TEXT

SCREEN MASTER VIDEO Output Control Generator develops split screen routines to combine ROM text & graphics images and links them to your basic or assembly programs. Documented with address tables & source files. Auto features, easy to use. Min. 48K II+ or IIe, DOS 3.3 Demo $5, Program Disk $19.95, Check or MO.
RODNEY BURLEIGH
447 Grand Avenue
Rochester, NY 14609
(716) 288-2172

SOFTWARE/ HOBBIES

ASTROLOGY SOFTWARE

We have everything from the under-$50 ASTROSCOPE™ and SEX-O-SCOPE,™ which read the Horoscope as well as cast it, on up to high-accuracy calculation packages for professional astrologers. Our printing text programs, including PERSONAL NUMEROLOGY,™ come with a license to sell the printed output.
AGS SOFTWARE
P.O. Box 28
Orleans, MA 02653
(617) 255-0510

BOWL-KEEPER

This program maintains all scores and calculates weekly average, accumulated average, weekly series, total pins, handicap, high game, and high series. Written in AppleSoft and is unprotected. Requires 48K Apple II+/IIe and disk drive. Printer recommended. $29.95 plus $2.00 postage. (FLA residents add 5% sales tax).
SOFTWARE UNLIMITED
P.O. Box 6361
Clearwater, FL 33518
(813) 797-7815

ATTENTION: COIN COLLECTORS

Unique program records entire collection and produces various reports that serve for personal investment information. Built-in market value provides latest prices for 1600 U.S. coins. Requires 48K/1 drive/printer. **Coins** software & manual $95 (Manual only-$10). VISA/MC OK. QUARTERLY **Coins** value updates $25.
COMPU-QUOTE
6914 Berquist Ave. Dept. AZ.
Canoga Park, CA 91307
(213) 348-3662

SOFTWARE/ LANGUAGES

FORTH SOFTWARE PACKAGES

Forth is a structured high level language best known for its speed and interactive compiling capabilities. Our forth packages include a screens disk containing: a full screen editor, 6502 assembler, decompiler, arrays and many other examples. Fig-forth package price $40.00. Forth-79 price $60.00.
ON-GOING IDEAS
Rd. #1, Box 810
Starksboro, VT 05487
(802) 453-4442

SOFTWARE/ PERSONAL

KITCHEN PLANNER

Create a 1-14 day Menu and Shopping List in less than 5 min. The only program available which both composes balanced meals and lets you change them! It's also the fastest and easiest to use. Compact, useable printout. To order send $29.95 + $1.50 (handling) or call with VISA/MC. All Apple II's. CA add 6½%.
SAV-SOFT PRODUCTS
P.O. Box 24898
San Jose, Calif. 95154
(408) 978-1048

SOFTWARE/REAL ESTATE

THE PROPERTY MANAGER

Whatever type of income property you have, the accounting and record keeping chores are complicated. The Property Manager will do all your finances, from cash receipts/disbursements to accounts receivable up to its own general ledger. It writes checks and statements, prepares mailing labels and prints out any report. $295.
Apple II, II+, IIe with 48K.
DATAMOST
8943 Fullbright Avenue
Chatsworth, CA 91311
(213) 709-1202

REAL ESTATE INVESTMENT PROGRAM

REIP PROVIDES THE sales professional with the ability to forecast investment performance in changing market environments. REIP performs the analytic steps quickly, allowing successful and profit making answers. REIP lets the seller re-structure any deal using different financing plans. $179.95. Apple II, II+, IIe with 48K or IBM PC.
DATAMOST
8943 Fullbright Ave.
Chatsworth, CA 91311
(213) 709-1202

APPLE DIRECTORY

SOFTWARE/STOCK ANALYSIS

STOCK TREND ANALYZER

Graphic representation of buy/sell indications based on resistance and support theories. System has been in existence for over 10 years. $125 includes documentation/instructions. (For Apple, IBM PC, CP/M systems).

LOGIC UNLIMITED
7405 University St.
Suite 1
Des Moines, IA 50311
515/274-2541

THE MARKET TECHNICIAN

The Market Technician allows you to store and retrieve stock market data and analyze the data using your own format. Portfolios of up to 40 stocks may be maintained with complete price and volume information. You can compute and display trend lines, correlate 2 data files, and make statistical projections. Data can be entered directly from the Dow Jones news services. Apple II, II+, IIe with 48K.

DATAMOST
8943 Fullbright Avenue
Chatsworth, CA 91311
(213) 709-1202

SOFTWARE/UTILITIES

XPS—DIAGNOSTIC PROGRAM

Easy to use menu driven diagnostic utility for the Apple II, Apple II+, and Apple IIe computer systems. Checks RAMS, ROMS, disks, keyboard, peripherals, printers, 80-column cards (IIe only), monitor, and more. Comes with back-up disk and manual. Requires 48K and one disk drive. Specify computer, $49.95.

XPS Inc.
P.O. Box 140
Carlisle, PA 17013
(717) 243-5373

ESSENTIAL DATA DUPLICATOR

The newest and most powerful duplicator for Apple software. It is easier to use and backs up more of the newer software much more reliably than any other nibble or hardware backup on the market today. $79.95 plus $2.00 S/H (US), ($5.00 Foreign). VISA, Master Card accepted. See our display ad this issue:

UTILICO SOFTWARE
3377 Solano Ave., Suite 352
Napa, CA 94558
(707) 257-2420

INDEX TO ADVERTISERS

READER SERVICE NO.	ADVERTISERS	PAGE
114	Abacus Associates	26
172	Action Research Northwest	190
250	Advanced Computer Products	182
240	Advanced Microsystems	86
	Alf Products	164
203	Almaly Trading, Corp.	168
107	Amdek	8
243	Androbot	62,63
	Apple Computer	6,7
245	Appleware	183
261	Applied Analytics	193
	Applied Engineering	18
121	Applied Software Technology	29
262	Atari Software	16,17
156	Baudville	92
162	Bible Research	192
112	Blue Chip Software	12
170	Boston Company	189
225	Brady Company, The	71
110	Business Computers of Peterborough	21
116	Bytes and Pieces	79
142	Calsoft	142
165	Charles Mann Associates	179
160	Collins International Trading	162
194	Compress	66
290	Computer Discount Products	100
119	Computer Software Store	110
109	Concord Peripheral Systems	4
129	Conroy La Pointe	10,11
263	Data Link	183
264	Data Cue	113
185	Data Security	196
101	Design Ware, Inc.	Cover 3
196	Diversified Software Research	28
111	Double Gold Software	68
126	800 Software	27
169	Eastside Software	181
173	Enhancement Technology Corporation	200
159	Fiberbilt	110
	Financial Software	108
212	Formula International	166
292	Foxware Products	187
265	Garden of Eden	172
271	Hayes Products	87
	H&E Computronics	Cover 2
267	Hayden Software	97
266	Hayden Software	99
268	Hayden Software	101
269	Hayden Software	103
272	Howard Sams Books	158
180	Indus-Tool	179
145	Interactive Microware	143
274	Interactive Structures	111
186	Intra Computer	97
132	Kensington Microware	178
147	Lazerware	96
102	Leading Edge	Cover 4
153	Mark Donn	187
168	Mega Byte	143
199	Micro Co-op	170
248	Microsoft	91
247	Microsoft	115
151	Microtek	112
228	Milton Bradley	93
222	Mind Systems	23
125	Nonagon	20
149	Omega	76
130	Orange Micro	30,31
137	PC Ware	135
192	Personal Tutor Associates	84
276	Photographic Sciences	176
164	Pro/Pac	170
191	Prometheus	98
122	Prometheus	141
127	Protecto	22
113	Rhino Robots	24
197	Rising Sun	186
183	Robo Graphics	70
182	Rocky Mountain Software Systems	148
198	Sinenquanon	167
144	SJB Distributors	90
163	Softronics	25
133	Software Entertainment	120
198	Southern California Research	177
171	Spectrum Soft	194
238	Spies Laboratories	105
224	Standard and Poors	147
283	Starfire/Omnisoft	109
284	Stoneware, Inc.	119
232	Summa Software Corporation	131
234	Sundex	73
117	Sun Micro	80
105	Synetix Systems	72
139	Synetix Systems	5
246	Synetix Systems	140
289	3M	1
179	Titan Tech/Saturn Systems	102
123	Transend	89
143	Transtar	78
300	Tronix	67
190	Utilico	192
141	Videx	69
138	Voice Machine Communications	77
187	VR Data	85
135	Vufax	114
154	We Software	168
195	Zoom Telephonics	104

PDQ II MAKES YOUR APPLE MICRO PERFORM LIKE A MINICOMPUTER

PRODUCTIVITY INCREASE

PDQ II will make your Apple II or IIe outperform itself. It will fly through tasks which used to take hours. It will perform multiple tasks at the same time. Most Apple software programs will exhibit a 200 to 2,000 percent increase in speed, without reprogramming.

NEXT GENERATION CAPABILITIES

That's not all—when you plug a PDQ II into your Apple, it will provide the advanced features of the 16/32 bit MC68000 microprocessor. Your Apple will be capable of utilizing sophisticated, "next generation" software products.

ONE SIMPLE SOLUTION

PDQ II eliminates the need for numerous add-ons — it includes an integrated high speed pseudo-disk, printer/communicatons buffer, memory extension capability and a powerful 16/32 bit processor. PDQ II consists of two system boards which simply plug inside your Apple, making your Micro think it's a Mini.

INSURANCE FOR THE FUTURE

PDQ II provides a powerful p-System run time environment, making it possible for your Apple to take advantage of many of the hundreds of high-quality p-System applications...the same applications available for Digital, IBM, HP, and other computers.

PDQ II technology makes your current investment in software and training more productive, while providing an almost unlimited growth path.

PDQ II comes with a full one year warranty and will be available through your local Apple dealer. If you simply cannot wait, send your check or M.O. for $1495 (postage included) to: Enhancement Technology Corporation, P.O. Box 1267, Pittsfield, MA 01202. Mass residents must include 5% sales tax.

NOW AVAILABLE FOR $995
(WITHOUT USCD p-SYSTEM AND PASCAL)

PDQ II
The Ultimate Peripheral

PDQ II SYSTEM SPECIFICATIONS

Standard Features

Microprocessor
- 16/32 bit MC68000
- 10 MHZ

User Memory
- 256K Bytes RAM

Integrated Functionality
- Multiple printer/communications buffering
- Pseudo-disk operations
- Track buffering (p-System)

ETC Software
- ETC MC68000 Assembler
- ETC MC68000 System Monitor
- ETC p-System (version IV) to Apple DOS Interface Utility

Languages and Software Systems Supported
- Applesoft BASIC Compatibility & Speed up
- Apple DOS 3.3
- UCSD p-System (version IV) Interpreter—executes UCSD Pascal, FORTRAN-77 and BASIC P-Code
- UCSD Pascal ***(Now Included!)***

Optional Features

Hardware
- 1 Megabyte RAM (Fall 1983)

Software
- UCSD p-System Development System
- FORTRAN
- BASIC
- Unix-like Operating System
- Artificial Intelligence Laboratory incorporating a Deductive Reasoning System (Spring 1984)

ETC ENHANCEMENT TECHNOLOGY CORPORATION

Apple II and Apple IIe are registered trademarks of Apple Computer, Inc. UCSD p-System is a registered trademark of the Regents of the University of California. Digital is a registered trademark of Digital Equipment Corporation. IBM is a registered trademark of International Business Machines Corporation. Osborne is a registered trademark of Osborne Computer Corporation.

CIRCLE 173 ON READER SERVICE CARD

FREE INFORMATION

The Magazine for Apple Microcomputing

Wanting to learn more about a product that is advertised or mentioned in this month's issue of A+ is as easy as 1-2-3 and *absolutely* free.

1

Print your name clearly on the attached Reader Service Card. Please use only one card per person.

2

Circle the numbers on the card that correspond to the numbers at the bottom of the advertisements or articles for which you want more information. (Key numbers for *advertised products* also appear in the Advertisers' Index.)

3

Mail the card, and the information on the products you requested will be mailed to you free of charge by the manufacturer.

This address is for Free Information only. For other inquiries please write to:
A+ —the Monthly Guide to the Apple Microcomputer
One Park Avenue
New York, N.Y. 10016

A+ The Magazine for Apple Microcomputing

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131
132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162
163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193
194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224
225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255
256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286
287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317
318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348
349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379
380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410
411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441
442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472
473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503
504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534
535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565
566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596
597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627
628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658
659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689
690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720
721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751
752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782
783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800

PLEASE PRINT CLEARLY—Use only one card per person

NAME_____ PHONE NO. (_____)_____

COMPANY_____

ADDRESS_____ APT._____

CITY_____ STATE_____ ZIP_____

(Zip code must be included to insure delivery.) Void after March 31, 1984

A+ 1842

4 ☐ **Send me 12 issues of A+ for $19.97 and bill me later. (Full 1 year subscription price $24.97.)**

A+ The Magazine for Apple Microcomputing

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131
132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162
163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193
194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224
225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255
256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286
287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317
318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348
349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379
380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410
411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441
442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472
473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503
504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534
535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565
566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596
597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627
628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658
659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689
690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720
721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751
752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782
783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800

PLEASE PRINT CLEARLY—Use only one card per person

NAME_____ PHONE NO. (_____)_____

COMPANY_____

ADDRESS_____ APT._____

CITY_____ STATE_____ ZIP_____

(Zip code must be included to insure delivery.) Void after March 31, 1984.

A+ 1841

4 ☐ **Send me 12 issues of A+ for $19.97 and bill me later. (Full 1 year subscription price $24.97.)**

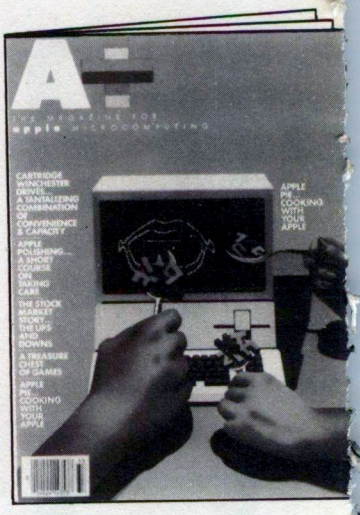
The Magazine for
Apple Microcomputing

PUT STAMP HERE
THE POST OFFICE
WILL NOT DELIVER
MAIL WITHOUT
POSTAGE

P.O. Box 7715
Philadelphia, Pa. 19101

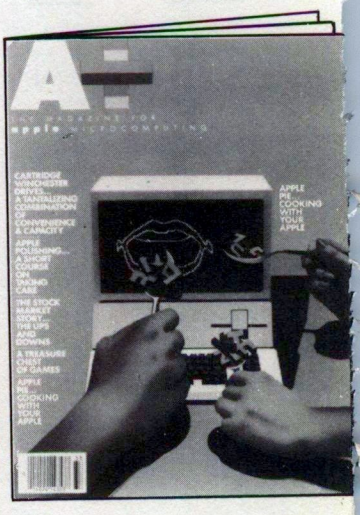
FREE INFORMATION

about the products and services advertised in this issue of

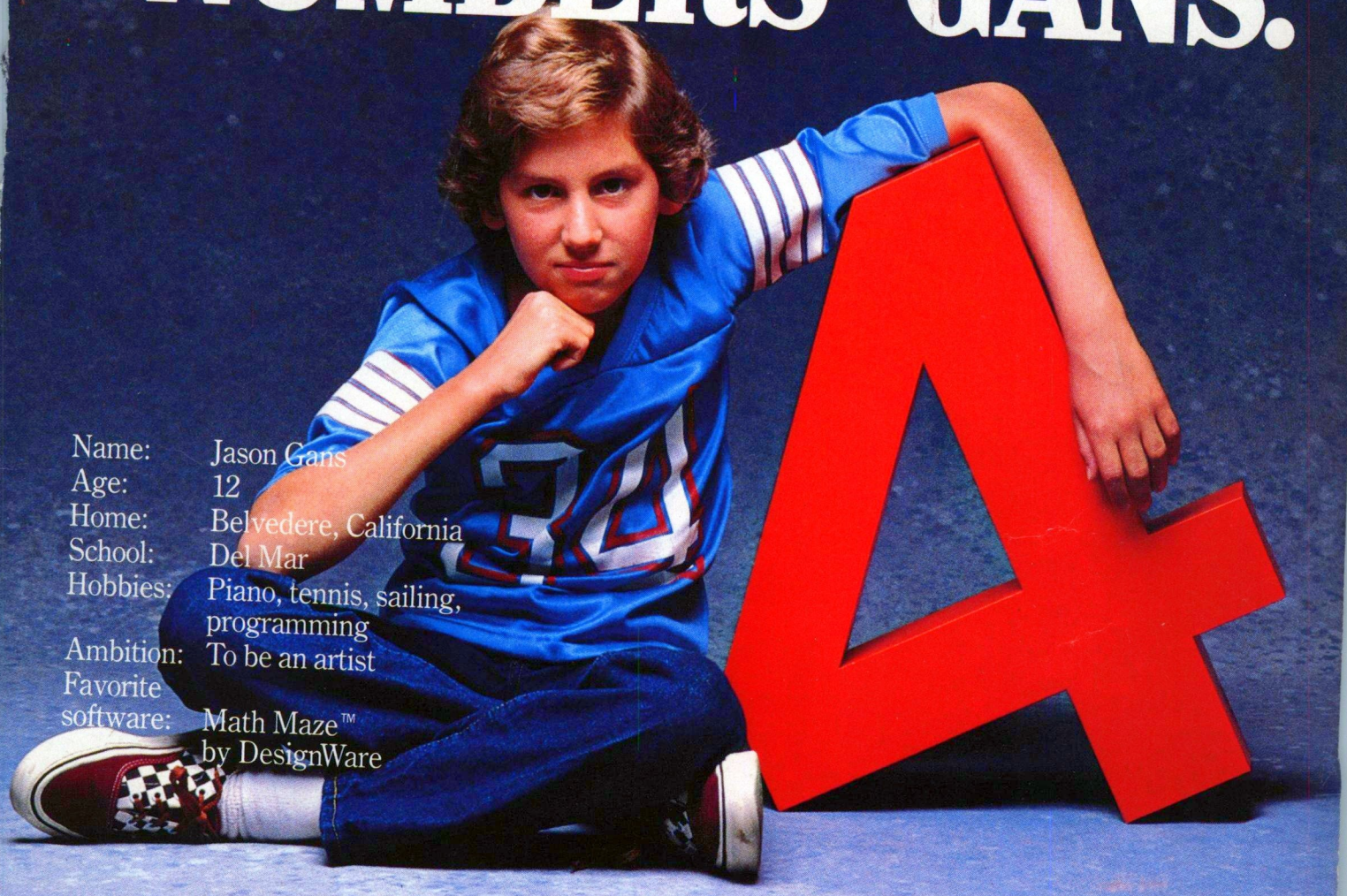


PUT STAMP HERE
THE POST OFFICE
WILL NOT DELIVER
MAIL WITHOUT
POSTAGE

P.O. Box 7715
Philadelphia, Pa. 19101



THEY CALL HIM "NUMBERS" GANS.



Name: Jason Gans
Age: 12
Home: Belvedere, California
School: Del Mar
Hobbies: Piano, tennis, sailing, programming
Ambition: To be an artist
Favorite software: Math Maze™ by DesignWare

"Math Maze is neat because you do more than just add and subtract numbers all the time. You've got to find them first. And then get there before you get caught.

"It's got real good graphics. I can even change the background color. And make the math as challenging as I want.

"There's lots of mazes, too. But the best thing is, I can make up my own. So when my friends come over, I've always got something new."

DESIGNWARE ON CREATIVITY.

Children learn the most through creative problem solving. That's why *Math Maze,* like so many DesignWare games, is an open-ended exercise that challenges and nourishes young minds. In a way that's a lot of fun.

DesignWare programs encourage kids to draw on something they just happen to have an unlimited supply of—imagination!

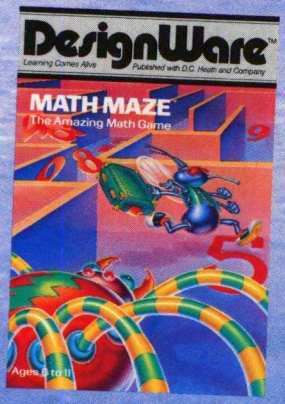
SPELLING, MATH, OR LANGUAGE

Games like *Math Maze, Spellicopter*™ and *Creature Creator*™ inspire youngsters to tap into that fertile idea-field. To actively become part of the program, in effect creating "new" games as they go along. And all the while building up solid skills in the basics. And all the while having a lot of plain old fun.

DesignWare. We make learning come alive. On Apple II,® IBM® and Atari® computers.

Ask for DesignWare products at your local software retailer. Or call us at 800-572-7767 (in California, 415-546-1866) and ask for our free catalog.

As Jason Gans says, "Hey—they don't call me 'Numbers' for nothing, you know!"



Apple II is a registered trademark of Apple Computer, Inc.
IBM is a registered trademark of International Business Machines.
Atari is a registered trademark of Atari, Inc.

DesignWare™

LEARNING COMES ALIVE

CIRCLE 101 ON READER SERVICE CARD

THE SECRETS OF PERFECT MEMORY: ONE AND ONE HALF EARTH DOLLARS

AT LAST: THE WHOLE TRUTH ABOUT FLOPPIES.

Amazing book reveals all!

How to keep from brainwashing your disk so it never loses it's memory.

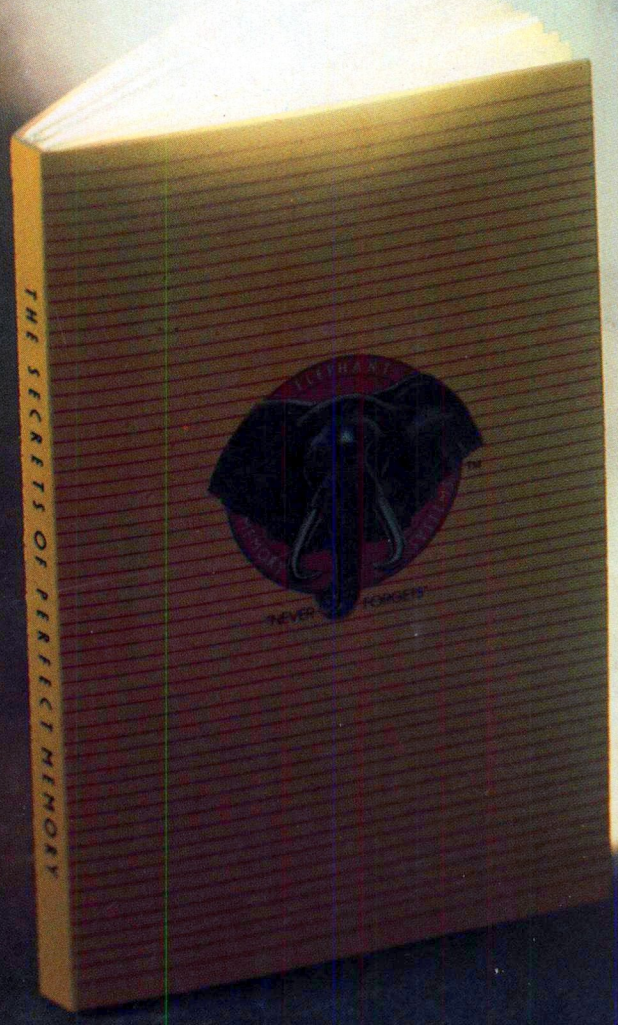
How fingerprints can actually damage disks. Unretouched Kirlian photographs of UFO's (Unidentified Floppy Objects)! The incredible importance of making copies: the Department of Redundancy Department—and what goes on when it goes on! Powerful secret methods that scientists claim can actually prevent computer amnesia! All this, and much more . . .

In short, it's an 80-page plain-English, graphically stunning, pocket-sized definitive guide to the care and feeding of flexible disks.

For The Book, ask your nearest computer store that sells Elephant™ disks, and bring along one and one half earth dollars.

For the name of the store, ask us.

Elephant Memory Systems®
Marketed exclusively by Dennison Computer Supplies, Inc., 55 Providence Highway, Norwood, MA 02062. Call toll free 1-800-343-8413. In Massachusetts, call collect (617) 769-8150. Telex 951-624.



CIRCLE 102 ON READER SERVICE CARD

Save up to 35% on

Yes! I want to subscribe for

- ☐ One year (12 issues) only $14.97—25% off!
- ☐ Two years only $27.97—30% off!
- ☐ Three years only $38.97—35% off!

Savings based on full one-year subscription price of $19.97

CHECK ONE: ☐ Payment enclosed. ☐ Bill me later.

Please charge my credit card:
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Mr./Mrs./Ms._____
(please print full name) 8H179

Address_____

City_____

State_____ Zip_____

Offer valid in U.S. and Possessions only. Please allow 30 to 60 days for delivery of first issue.

Save up to 35% on

Yes! I want to subscribe for

- ☐ One year (12 issues) only $14.97—25% off!
- ☐ Two years only $27.97—30% off!
- ☐ Three years only $38.97—35% off!

Savings based on full one-year subscription price of $19.97

CHECK ONE: ☐ Payment enclosed. ☐ Bill me later.

Please charge my credit card:
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Mr./Mrs./Ms._____
(please print full name) 8H179

Address_____

City_____

State_____ Zip_____

Offer valid in U.S. and Possessions only. Please allow 30 to 60 days for delivery of first issue.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

P.O. Box 2450
Boulder, Colorado 80321

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

P.O. Box 2450
Boulder, Colorado 80321

SAVE $60.00 ON

A LIBRARY OF SOFTWARE PROGRAMS FOR APPLE COMPUTERS

A+ DISK MAGAZINE

YES! **Send me 6 issues of *A+ Disk Magazine* for just $119.00—34% off the full subscription price of $179.00.**

CHECK ONE:

☐ I enclose $_____.
(Residents of CA, CO, CT, FL, IL, MA, MI, MO, NJ, NY State, and VT add applicable sales tax.)

☐ Bill me later.

☐ Charge my:
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date____

Mr./Mrs./Ms._____
(please print full name)

Address_____ 8H054

State_____ Zip_____

Offer valid in U.S. and its possessions only. Please allow 30 to 60 days for delivery of first issue.

SAVE $60.00 ON

A LIBRARY OF SOFTWARE PROGRAMS FOR APPLE COMPUTERS

A+ DISK MAGAZINE

YES! **Send me 6 issues of *A+ Disk Magazine* for just $119.00—34% off the full subscription price of $179.00.**

CHECK ONE:

☐ I enclose $_____.
(Residents of CA, CO, CT, FL, IL, MA, MI, MO, NJ, NY State, and VT add applicable sales tax.)

☐ Bill me later.

☐ Charge my:
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date____

Mr./Mrs./Ms._____
(please print full name)

Address_____ 8H054

State_____ Zip_____

Offer valid in U.S. and its possessions only. Please allow 30 to 60 days for delivery of first issue.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, COLORADO

POSTAGE WILL BE PAID BY ADDRESSEE

A+DISK

P.O. Box 2469
Boulder, Colorado 80321

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, COLORADO

POSTAGE WILL BE PAID BY ADDRESSEE

A+DISK

P.O. Box 2469
Boulder, Colorado 80321